BACnet Operator Workstation User's Manual

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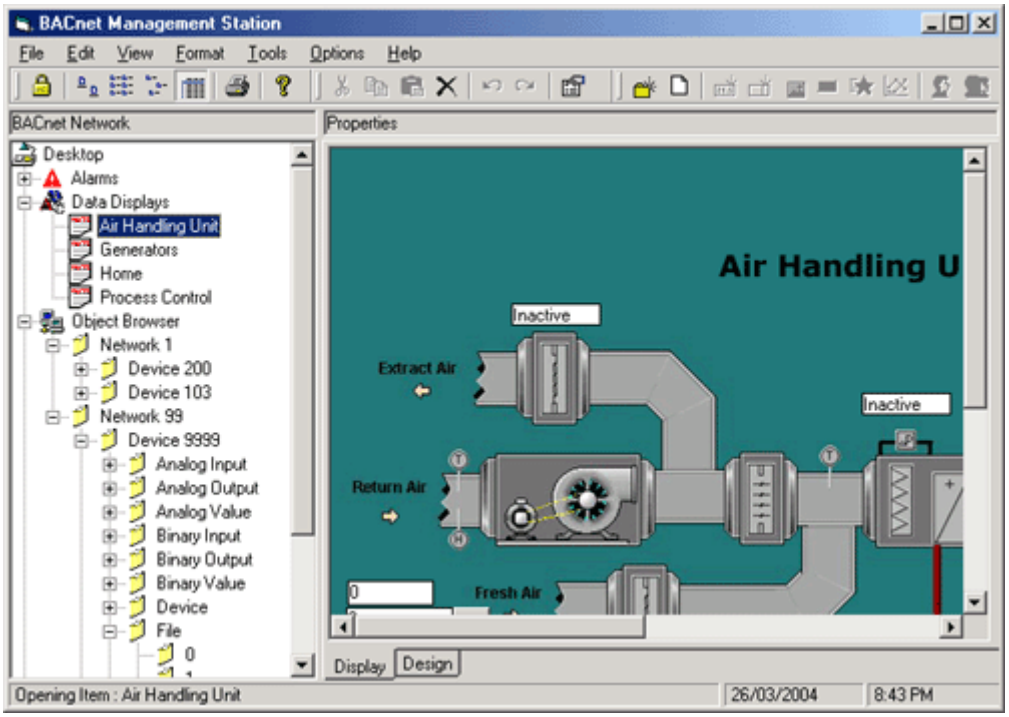
Introduction

The BACnet Operator Station is a Windows based application for Windows NT/2000/XP designed to communicate with a BACnet network. The Workstation supports Displays/Alarms and Time Schedules and provides a Windows based view of the BACnet network.



To the left of the screen is a Tree View, which is used to navigate through the system. The tree is broken up into sections which provide all of the functionality required by the Operator Station.

- **Alarms**
  In the Alarms section, all alarms received by the Operator station can be view in a list and printed out if required.
- **Data Displays**
  Data Displays are a graphical representation of the plant and equipment with Real-Time data overlayed from the BACnet network. A Display Designer is integrated into the Operator Station to allow for new displays to be Created/Edited.
- **Object Browser**
  The Object Browser is used to Navigate through the BACnet network and views all of the Objects within any device on the network. The Object Browser can also be used to edit objects within a device.
- **Reports**
  The reports section contains custom reports from the BACnet Database for the workstation. These reports include Operator Usage, Error and After Hours usage.
- **Security**

The Security Section is used by an Administrator to configure operator access to the Workstation. An operator would have restricted functionality and would be able to view but not edit features within the BACnet network.

- **Time Schedules**
  The Time Schedules Section provides for grouping under customised sections. An example of this would be to group schedules under a Building-Floor-Zone hierarchy.
- **Trends**
  The Trends Section provides for grouping under customised sections. An example of this would be to group schedules under a Building-Floor-Zone hierarchy. Trends can reference 1 or more Trend Schedule Objects.

Installation

This chapter describes how to install the SCADA BACnet Operator Workstation onto your PC. It is important that you check the System Requirements section before following the installation section for a step by step guide to the installation process.

System Requirements

The minimum hardware requirements for the BACnet Operator Workstation are:

- Intel® Pentium® 4 Processor
- 512 MB RAM
- 20 GB hard drive

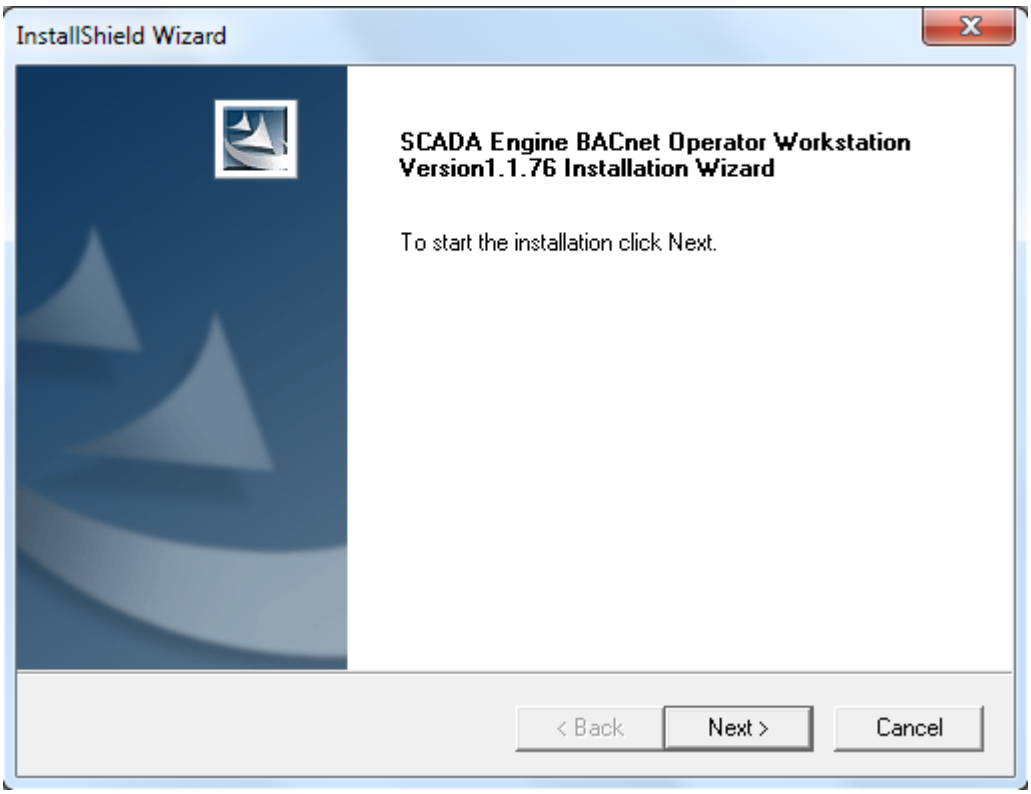
The SCADA Engine BACnet Operator Workstation can be used with the following operating systems:

- Microsoft Windows XP
- Microsoft Windows 2003 Server
- Microsoft Windows 2000
- Microsoft Windows Vista

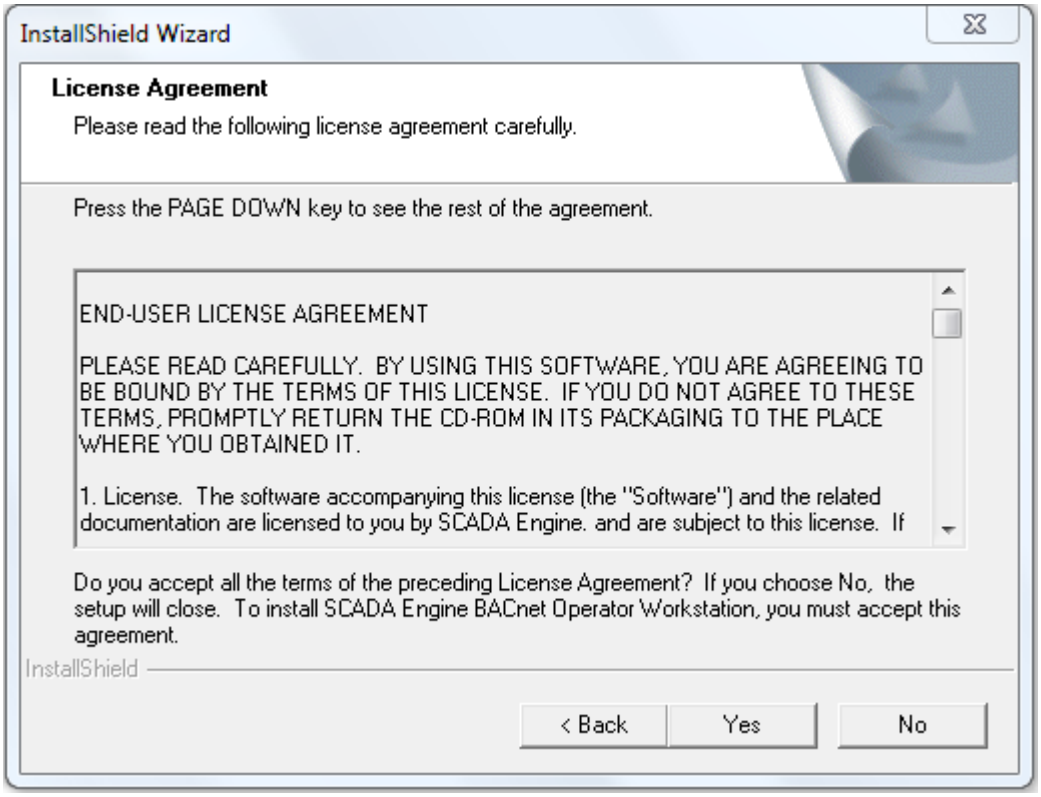
Install

Log onto the system as Administrator before running the installation program, it cannot be installed under a limited user account.

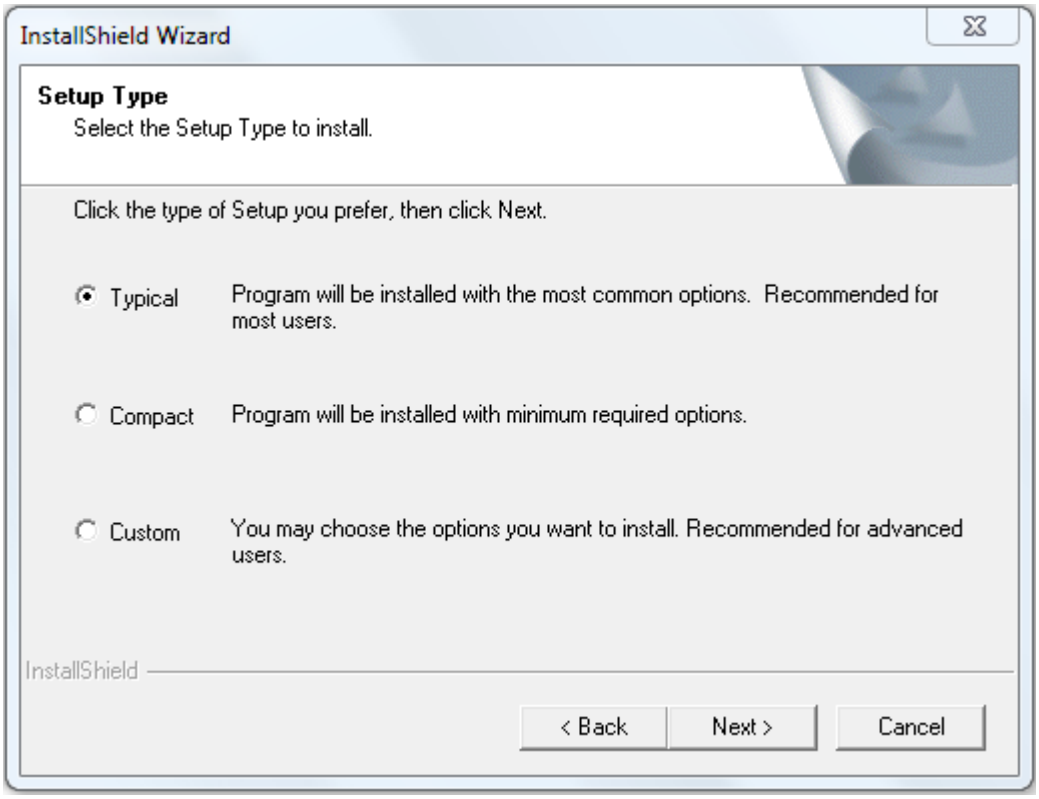
1. Place the SCADA Engine BACnet Operator Workstation CD into the CD drive, or double click on the BACnet Operator Workstation Setup program.
2. The Windows Installer will start and you should see the following screen.



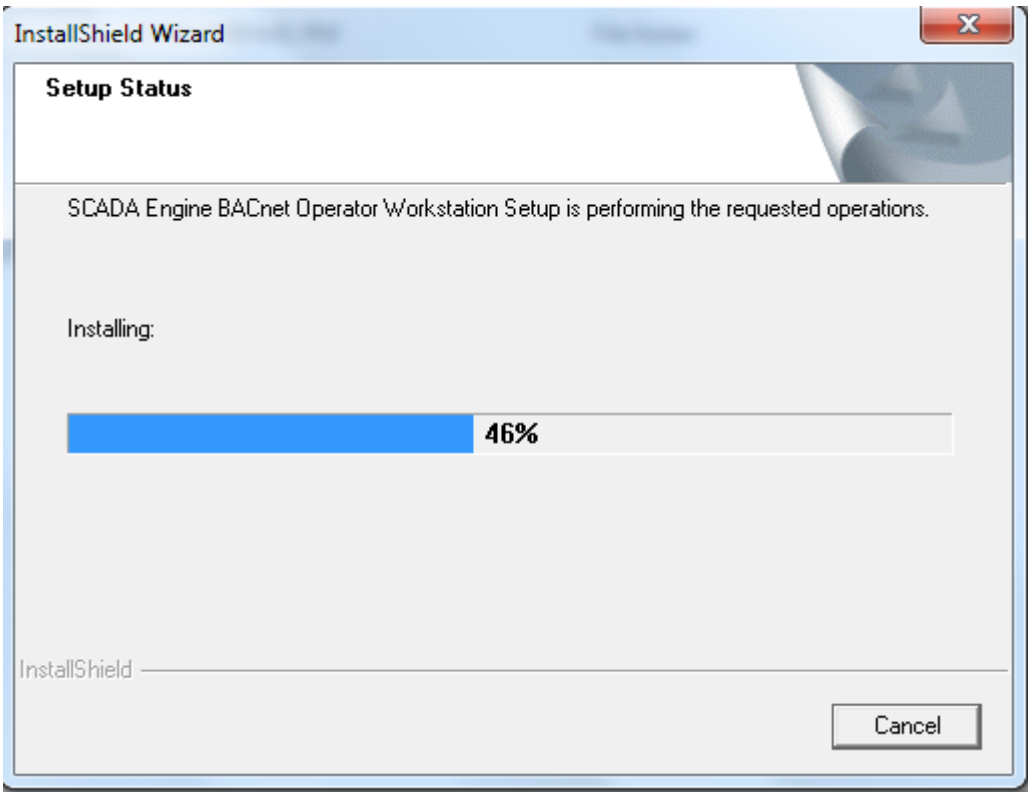
3. Click next Button. You will be displayed the “License Agreement” window.


InstallShield Wizard
License Agreement
Please read the following license agreement carefully.
Press the PAGE DOWN key to see the rest of the agreement.
END-USER LICENSE AGREEMENT
PLEASE READ CAREFULLY. BY USING THIS SOFTWARE, YOU ARE AGREEING TO BE BOUND BY THE TERMS OF THIS LICENSE. IF YOU DO NOT AGREE TO THESE TERMS, PROMPTLY RETURN THE CD-ROM IN ITS PACKAGING TO THE PLACE WHERE YOU OBTAINED IT.
1. License. The software accompanying this license (the "Software") and the related documentation are licensed to you by SCADA Engine. and are subject to this license. If
Do you accept all the terms of the preceding License Agreement? If you choose No, the setup will close. To install SCADA Engine BACnet Operator Workstation, you must accept this agreement.
InstallShield
< Back
Yes
No

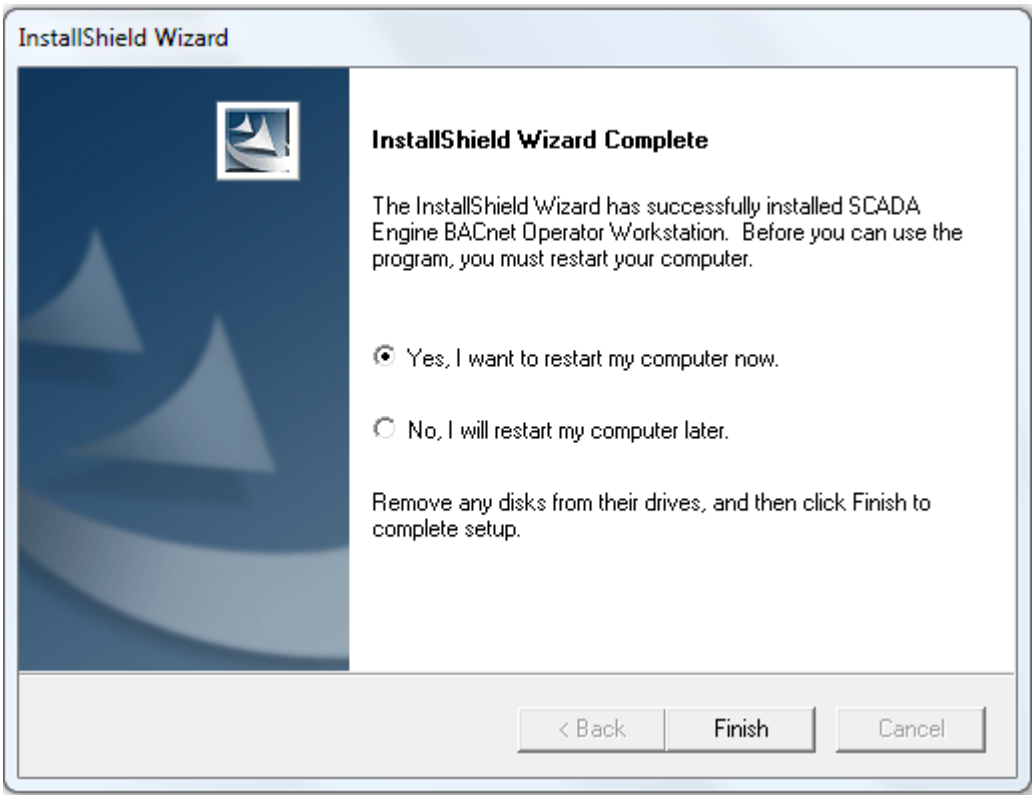
4. Click Yes Button. You will be displayed the “InstallShield Wizard” dialog.


InstallShield Wizard
Setup Type
Select the Setup Type to install.
Click the type of Setup you prefer, then click Next.
Typical
Program will be installed with the most common options. Recommended for most users.
Compact
Program will be installed with minimum required options.
Custom
You may choose the options you want to install. Recommended for advanced users.
InstallShield
< Back
Next >
Cancel

5. Click the type of Setup you prefer, and then click Next button. It will display the progress of the installation.



6. Once the installation is completed you will be displayed the following dialog. Click Finish Button to exit the wizard.


InstallShield Wizard
InstallShield Wizard Complete
The InstallShield Wizard has successfully installed SCADA Engine BACnet Operator Workstation. Before you can use the program, you must restart your computer.
Yes, I want to restart my computer now.
No, I will restart my computer later.
Remove any disks from their drives, and then click Finish to complete setup.
< Back
Finish
Cancel

Installed Files

The program files are installed by default into the C:\Program Files\SCADA Engine\ BACnet Operator Workstation directory on the hard drive. The list below lists all of the files installed into the Common subdirectory.

- BACnAPI.dll
- BACnBOWDB.dll
- BACnCFG.dll
- BACnCntl.ocx
- BACnetX.dll
- BACnWstn.exe
- cPopMenu6.ocx
- DayView.dll
- sites.db
- sqlite3.dll
- SQLiteDB.dll
- SSubTmr6.dll
- TeeChart5.ocx
- vbalTbar6.ocx
- WinPcap_3_0.exe

Application Data

Application data is stored onto the hard drive into the C:\Documents and Settings\All Users\Application Data\SCADA Engine\ BACnet Operator Workstation directory for Windows 2000, 2003 and XP. It is stored into C:\ProgramData\SCADA Engine\ BACnet Operator Workstation for Vista.

Uninstall

To remove the BACnet Operator Workstation, go to the Control Panel and select Add/Remove programs. Locate the entry for the BACnet Operator Workstation and remove it.

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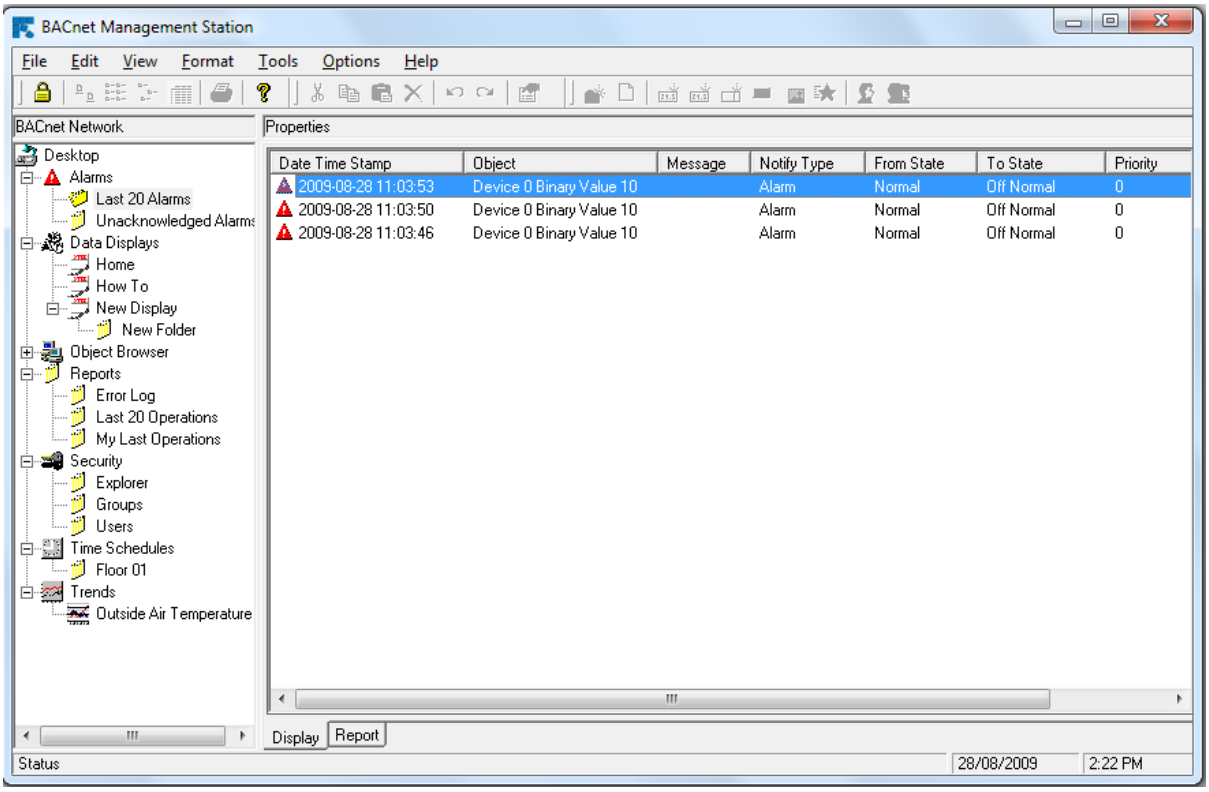
Reference

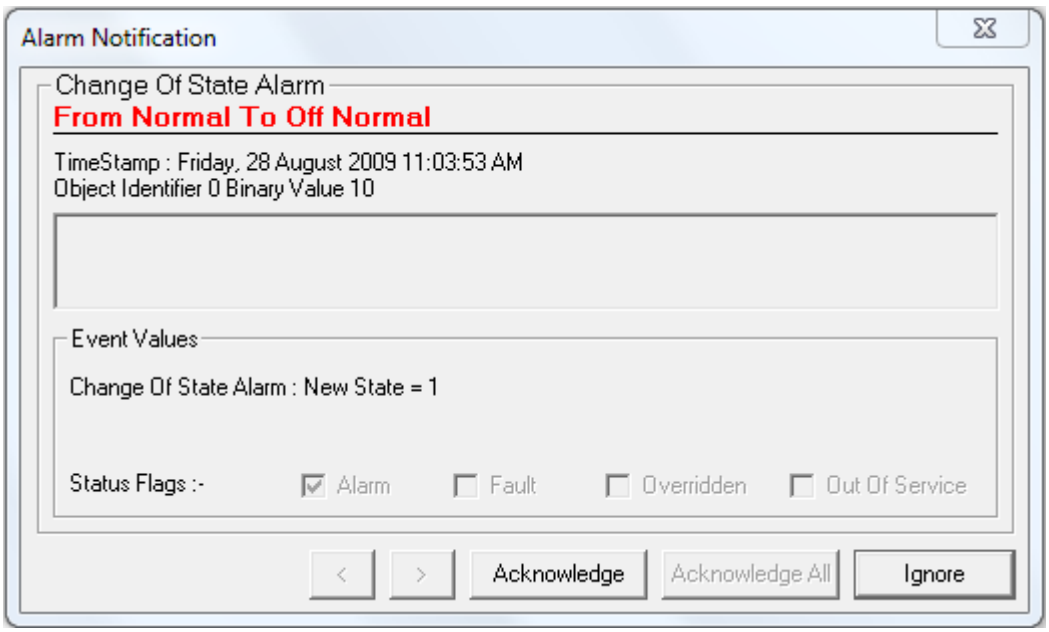
This section contains a tutorial with a step by step walk through all the functionalities of the BACnet Operator Station.

Alarms

In the Alarms section, all alarms received by the Operator station can be view in a list and printed out if required. The last 20 alarms and unacknowledged alarms will be listed in the **Last 20 Alarms** and **Unacknowledged Alarms** folder.



To double click any alarm, you will be displayed the “Alarm Notification” window. Then you can choose to **Acknowledge** or **Ignore** the alarm.

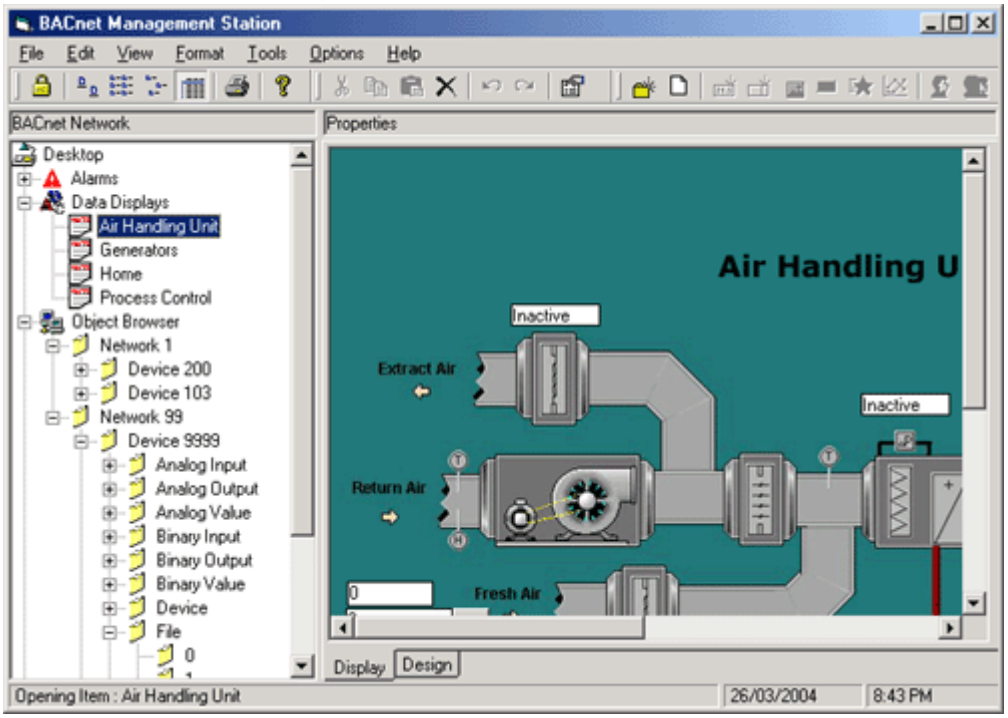


Data Displays

Data Displays are a graphical representation of the plant and equipment with Real-Time data overlayed from the BACnet network. A Display Designer is integrated into the Operator Station to allow for new displays to be Created/Edited.

Displays Overview

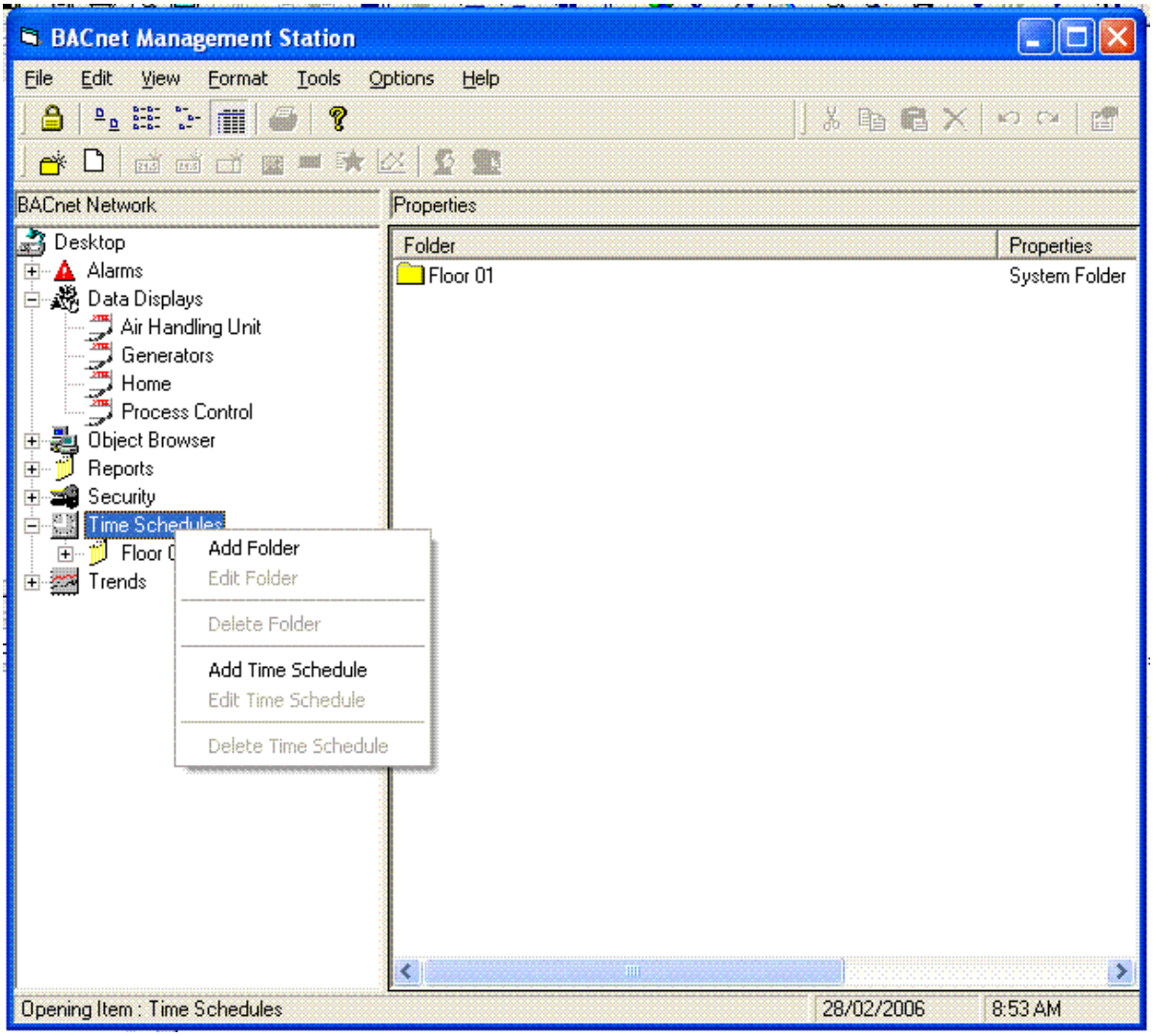
The Data Displays are listed in the Navigation Tree under the menu item **Data Displays**. To select a display, navigate from the Tree to the display you wish to view. At the bottom of the Display are two tabs for **Display** and **Design**. In display mode, the display will contain real time data from the BACnet Network. In Design Mode, the display can be edited.



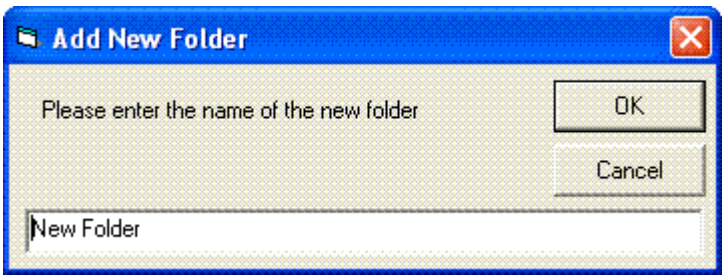
How Do I Create a Folder?

Folders appear in the BACnet Operator Workstation on the left hand side of the window. New Folders can be inserted into the Displays, Schedule and Trendlog sections of the Tree. Folders are used to group Information in the tree view in a logical manner to make it easy for an engineer to navigate through the system. Displays, for example, could be grouped into Floors and Zones to represent the different areas within the building.

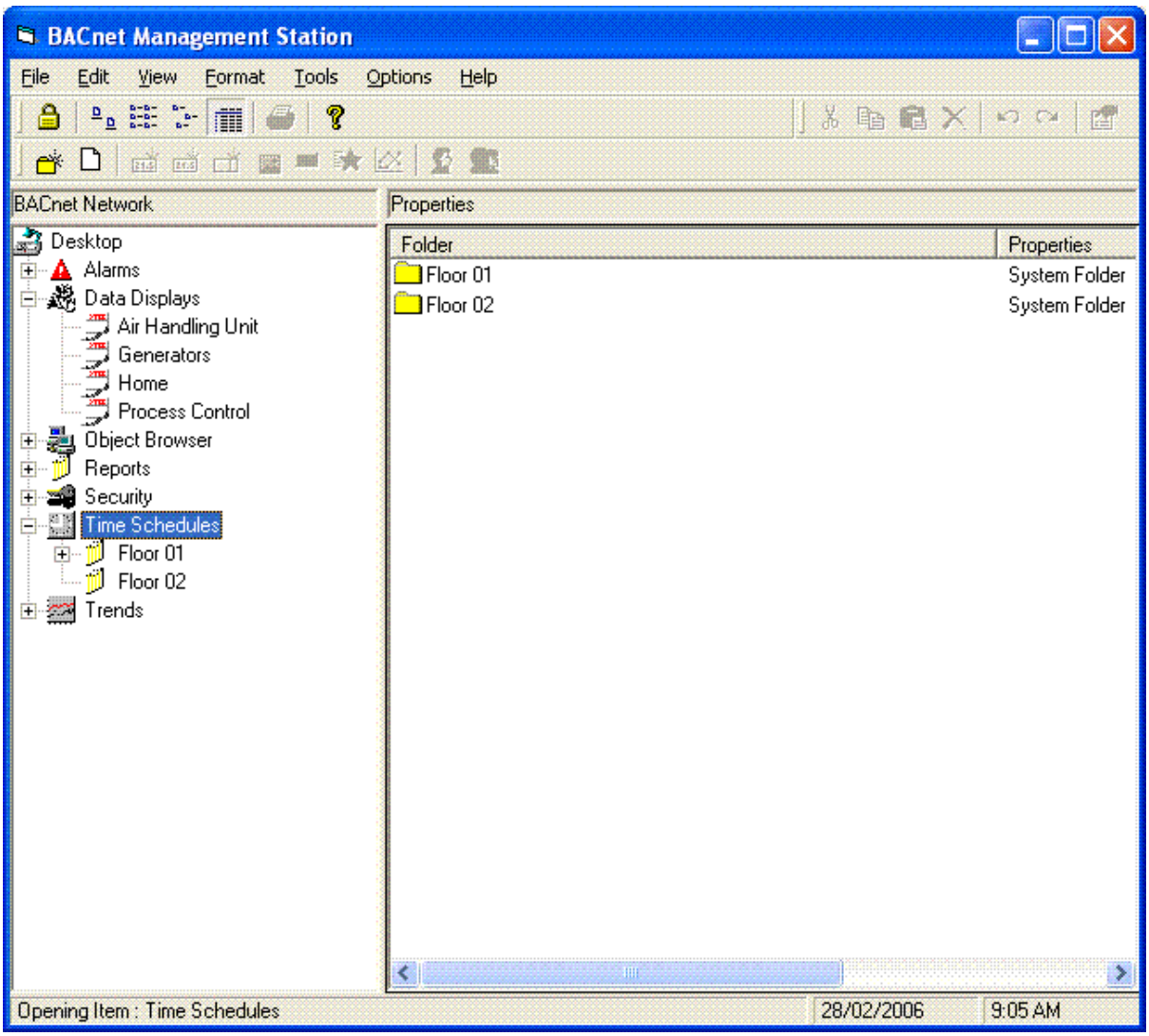
To Add a New Folder right click on the Tree at the spot where you want to have a folder created. This will bring up a menu as shown below.



Select the option "Add Folder" and the following dialog box will appear.



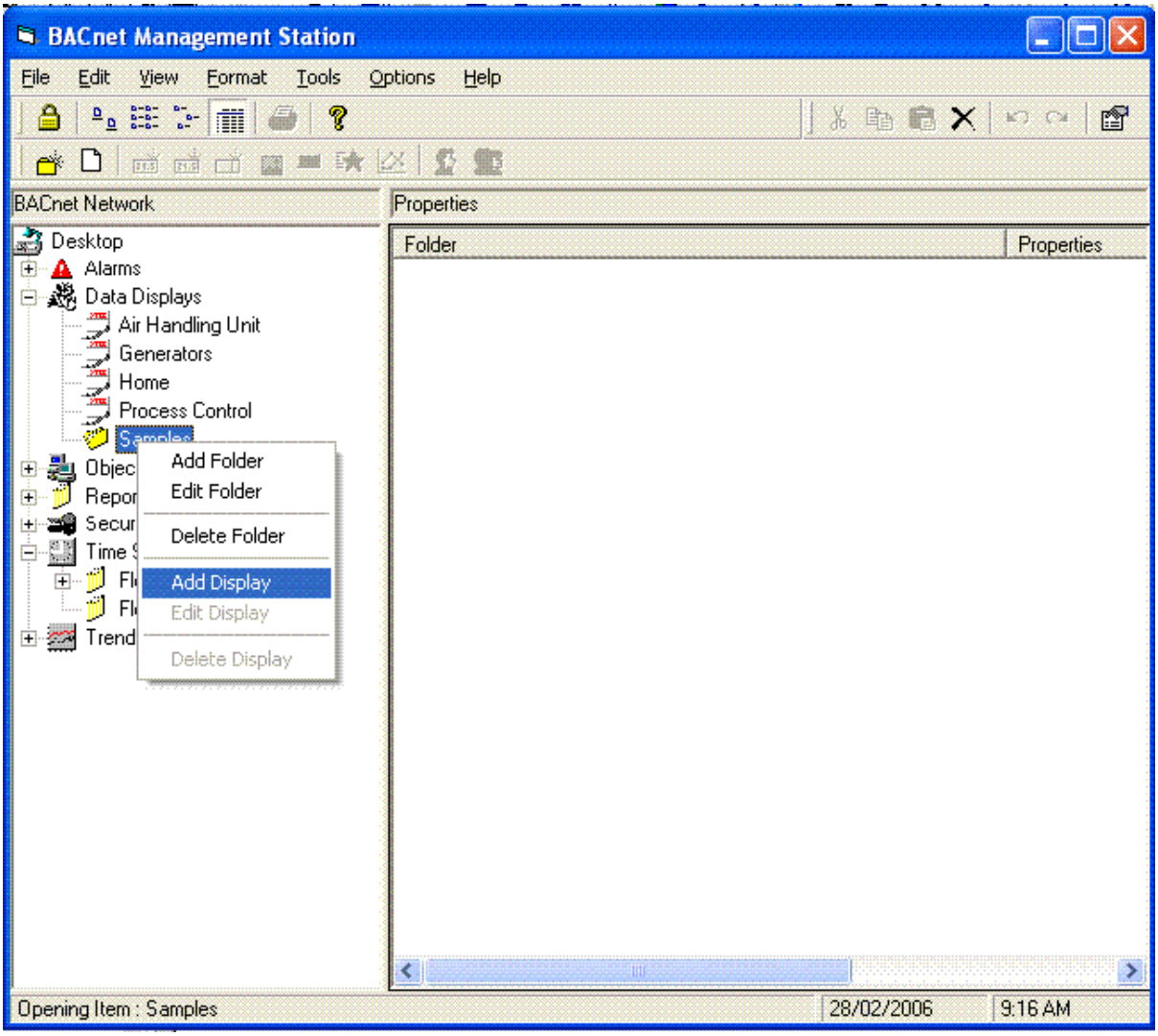
Select a Name for the Folder and then select OK and the new folder will appear in the tree view as shown below.



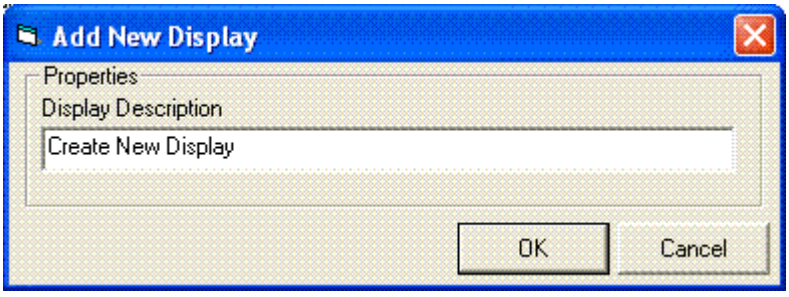
How Do I Create a Display?

Displays allow for real time information to be displayed in a graphical way. Real Time Data is overlayed onto a Picture representing the Plant and Equipment. Navigation is done from the Tree View and can also be done from within the display using an overlayed button.

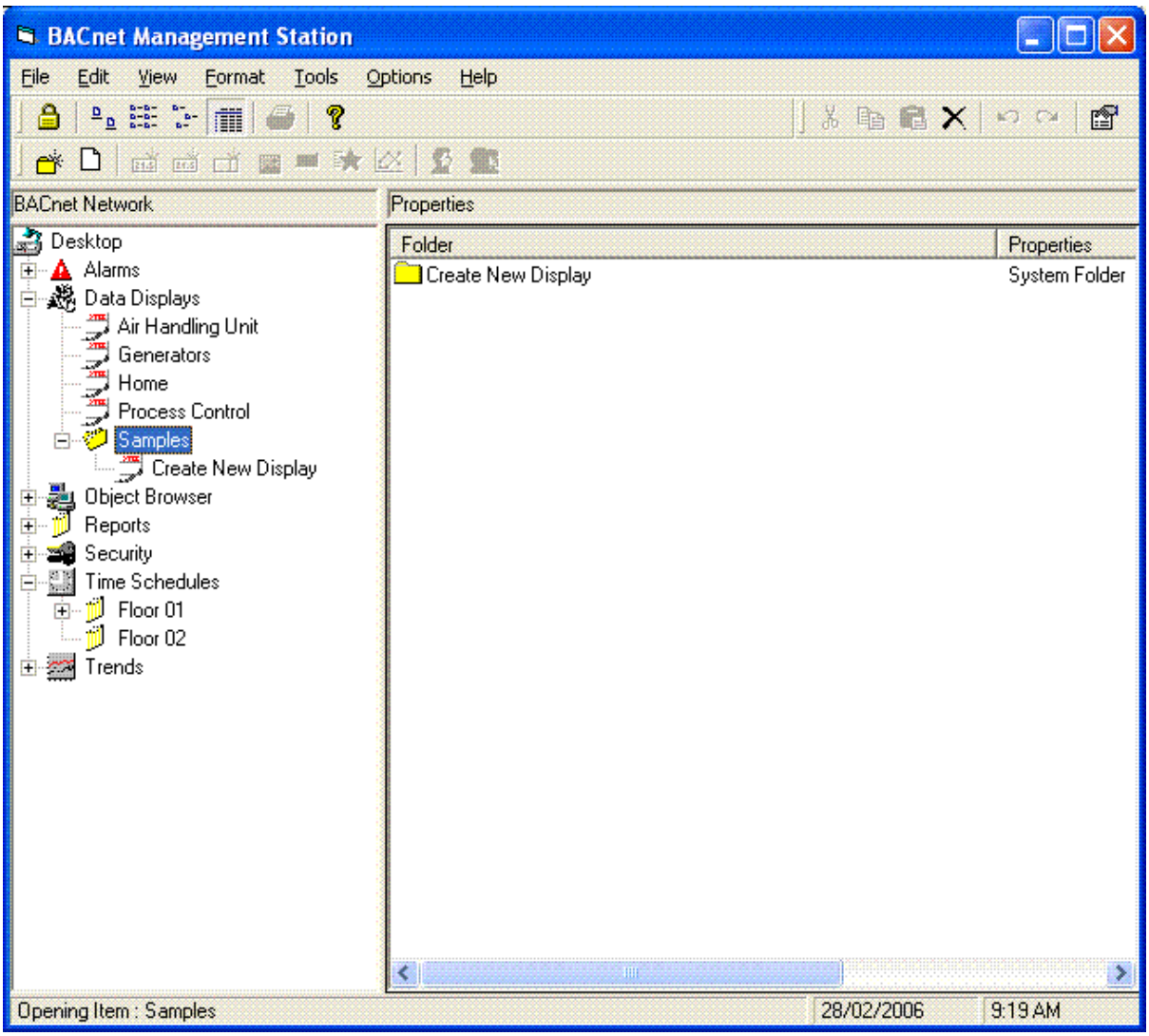
To Add a New Display, right click on the Tree at the spot where you want to have the display created. This will bring up a menu as shown below.



Select the option "Add Display" and the following dialog box will appear.

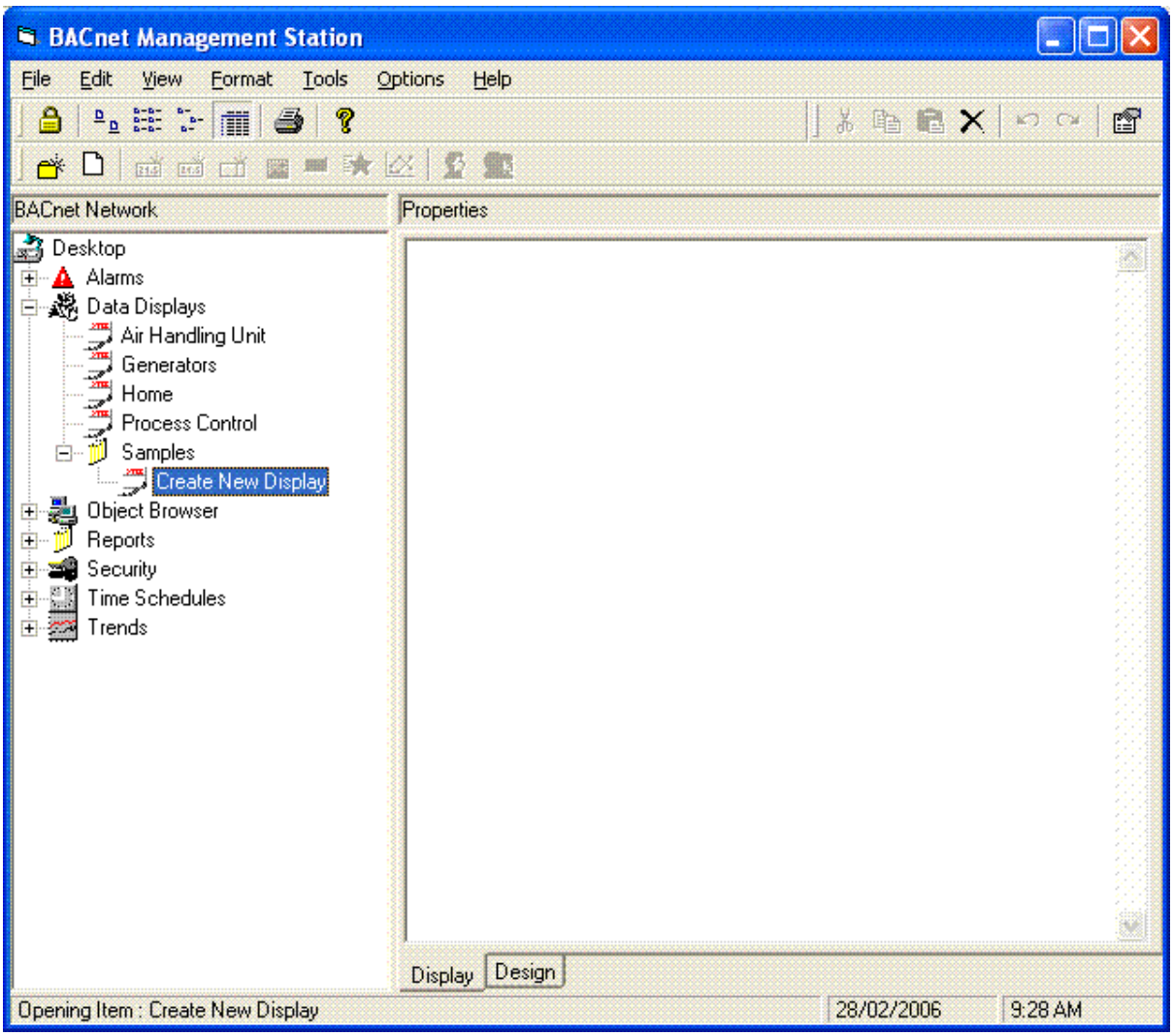


Select a Name for the Display and then select OK and the new display will appear in the tree view as shown below.

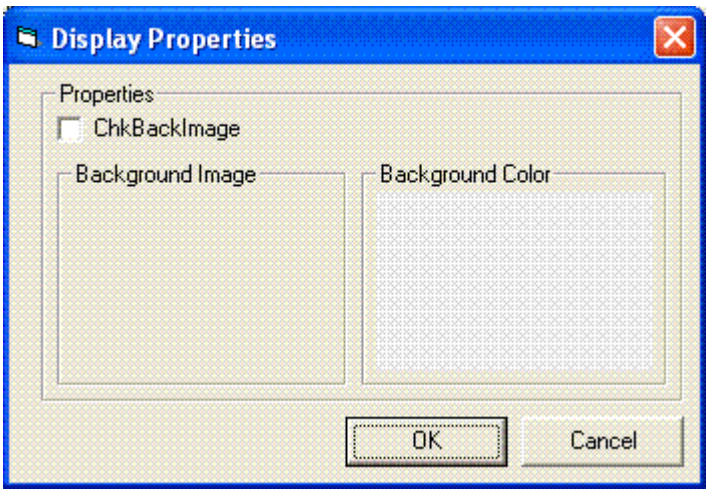


How Do I Edit a Display?

To Edit a Display, navigate to the display you wish to edit. At the bottom of a display there will be 2 tabs **display** and **design** as shown below.

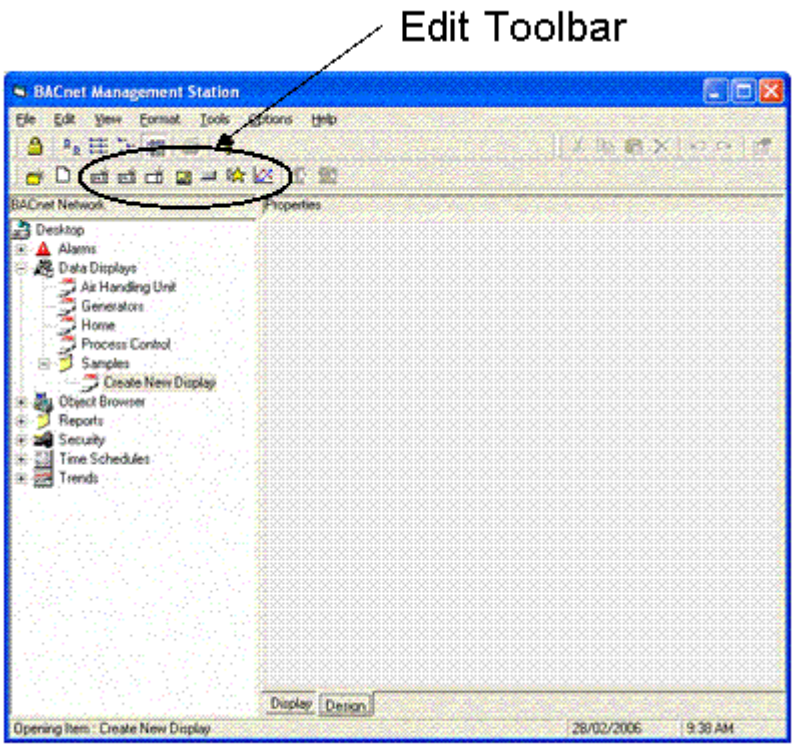


Select the Design tab to enter design mode. If the display is a new one, then you will see the following dialog which allows a background image or background colour to be selected. You can change the background colour, or the background image if required.



The toolbar will now have some additional buttons available for editing the displays as follows:

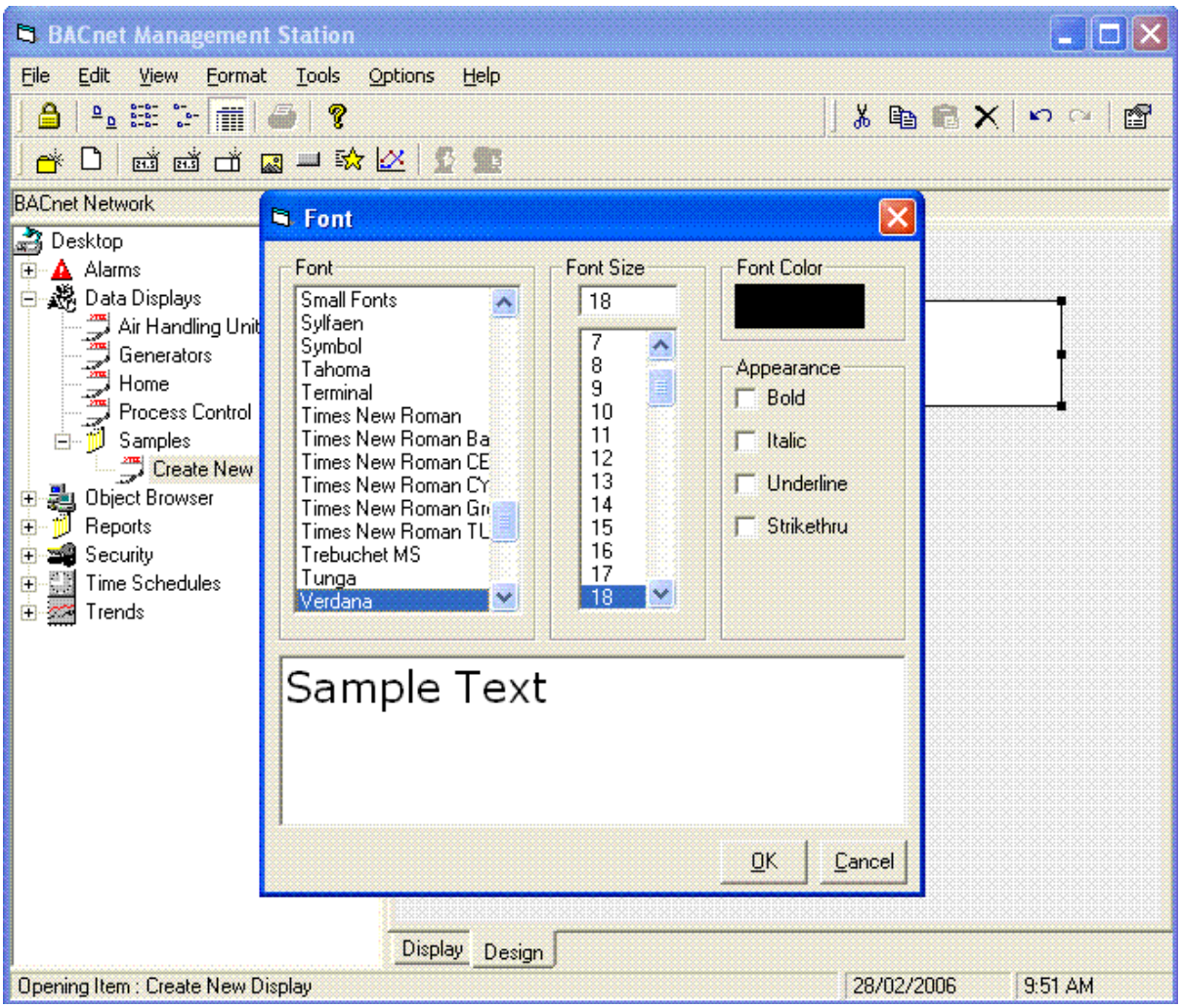
- Label - Allows Text to be overlayed onto the display.
- Read Only Property - Allows Read Only Real Time Data to be overlayed onto the display.
- Prompted Value - Allows Real Time Data to be overlayed onto the display with a button for modifying the value.
- Image - Allows an image to be overlayed onto the display.
- Button - Allows a button to be overlayed onto the display.
- Animation - Allows an animation activated by Read Only Real Time Data to be overlayed onto the display.
- Trend - Allows a trend to be overlayed onto the display.



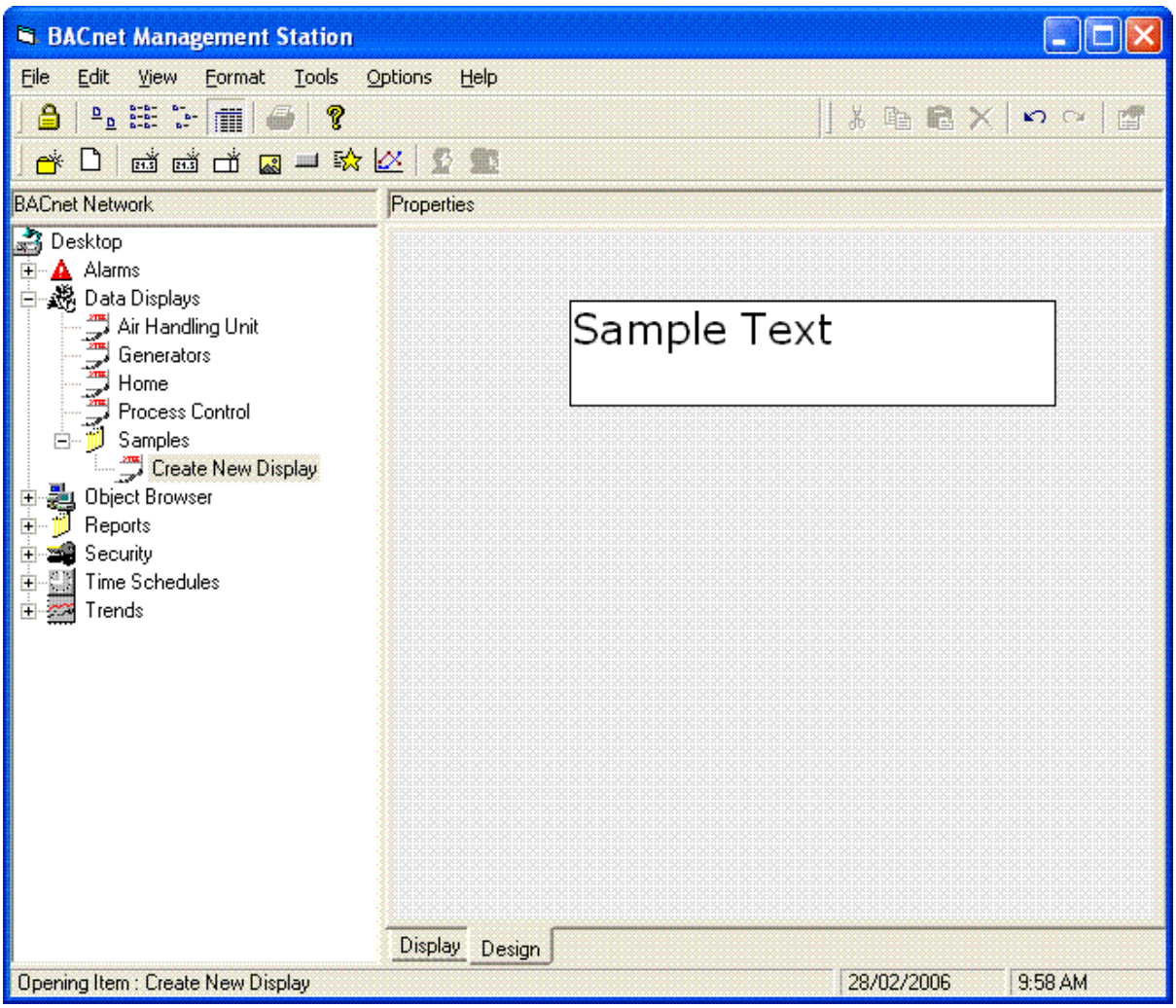
SCADA Engine How To Add Text To a Display

Text can be overlayed onto a display using the **Insert Label** toolbar option. The text can be formatted and can be positioned anywhere on the display.

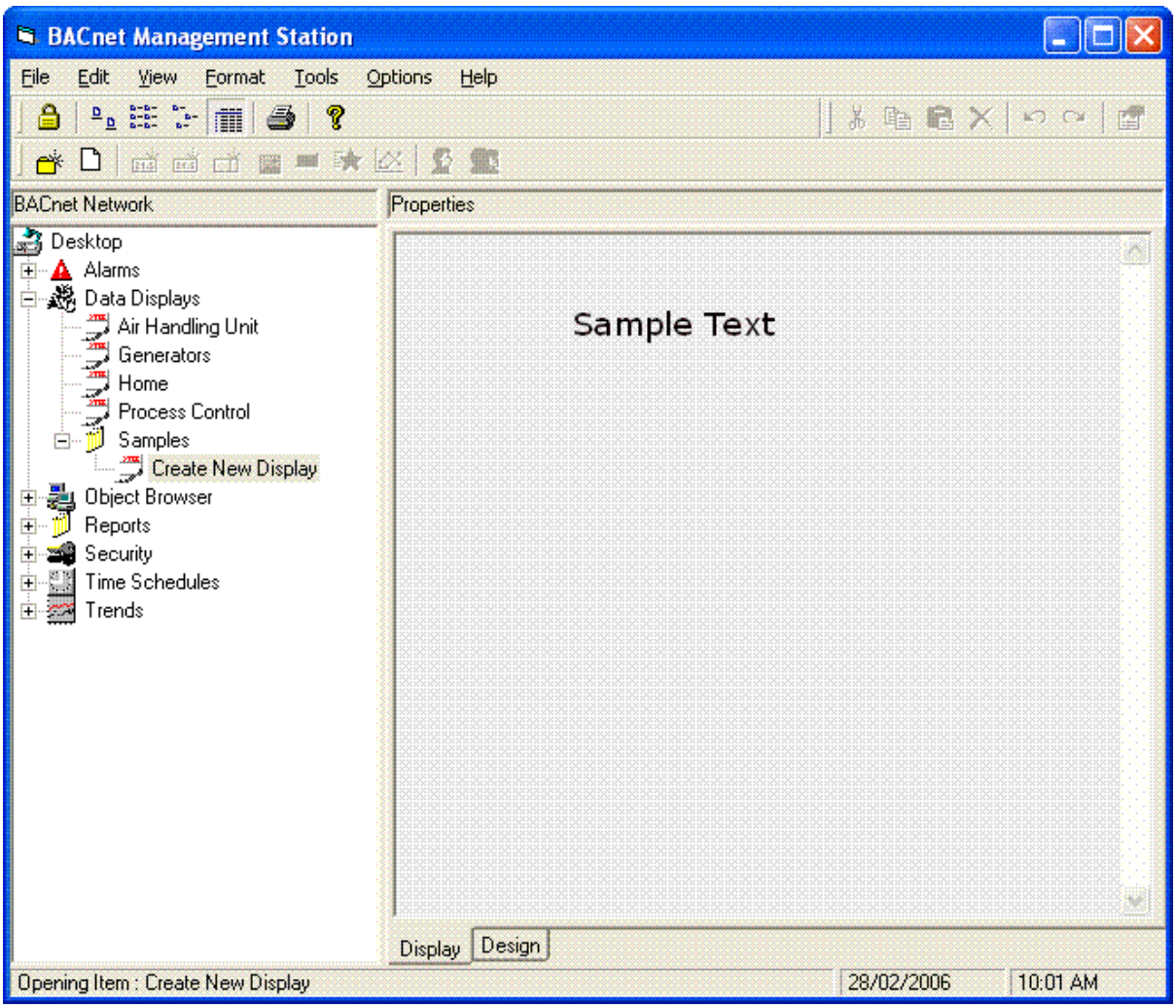
To add a label, select the **Insert Label** toolbar option and move it to the desired location, it can be resized using the mouse. Once it is in the desired location, double click on the label to bring up the formatting window as shown below.



Add some text into the textbox, change the font and click ok, the label will appear as follows.



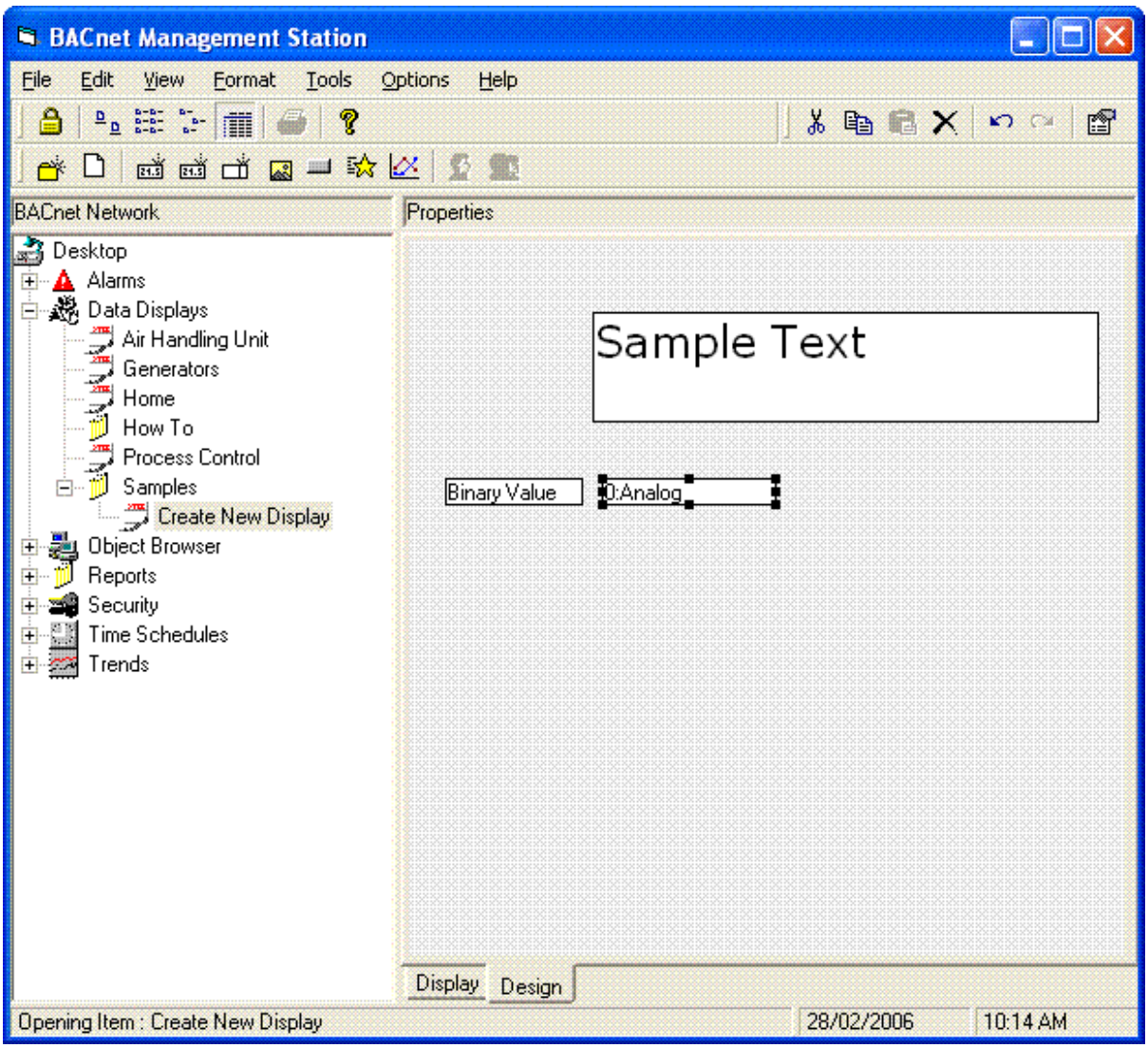
The Label has a white background, which will be invisible when viewed in display mode as follows.



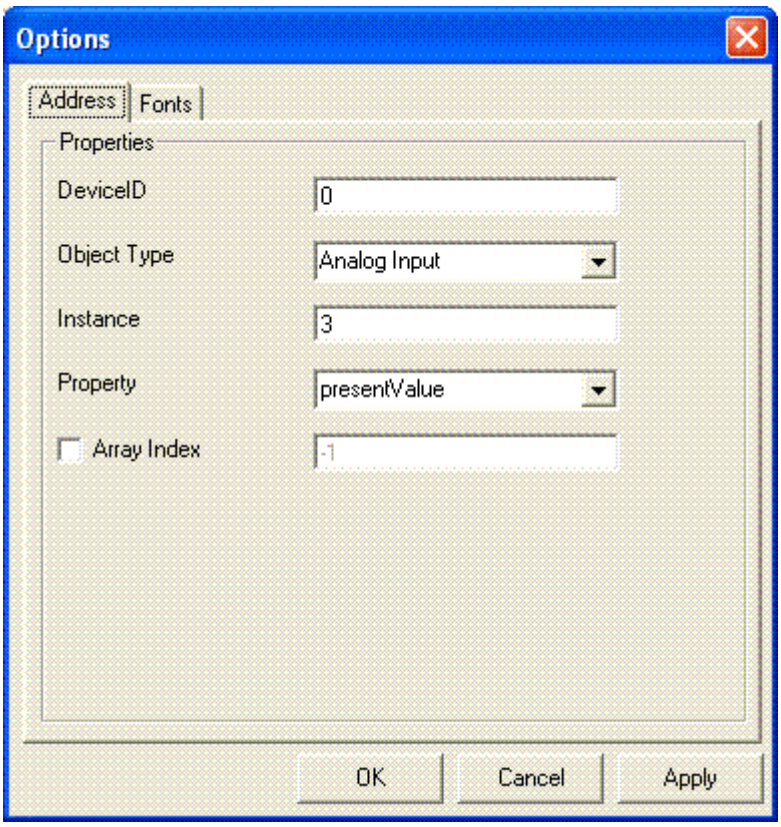
SCADA Engine How To Add Real Time Data To a Display

Real Time Data can be overlayed onto a display using the **ReadOnly Property** toolbar option. The text can be formatted and can be positioned anywhere on the display.

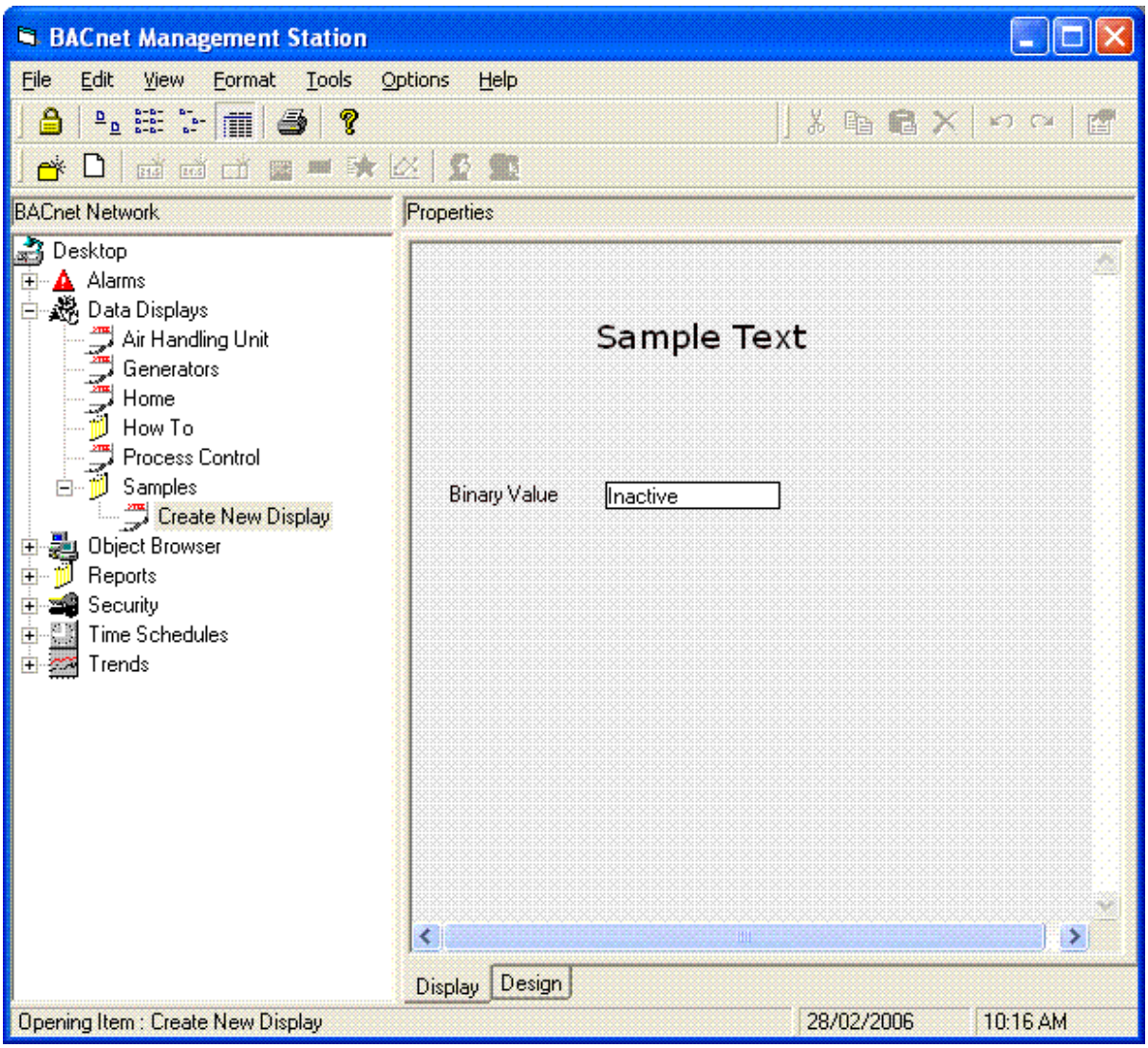
To Add a Read Only Property, select the **ReadOnly Property** toolbar option and move it to the desired location, it can be resized using the mouse.



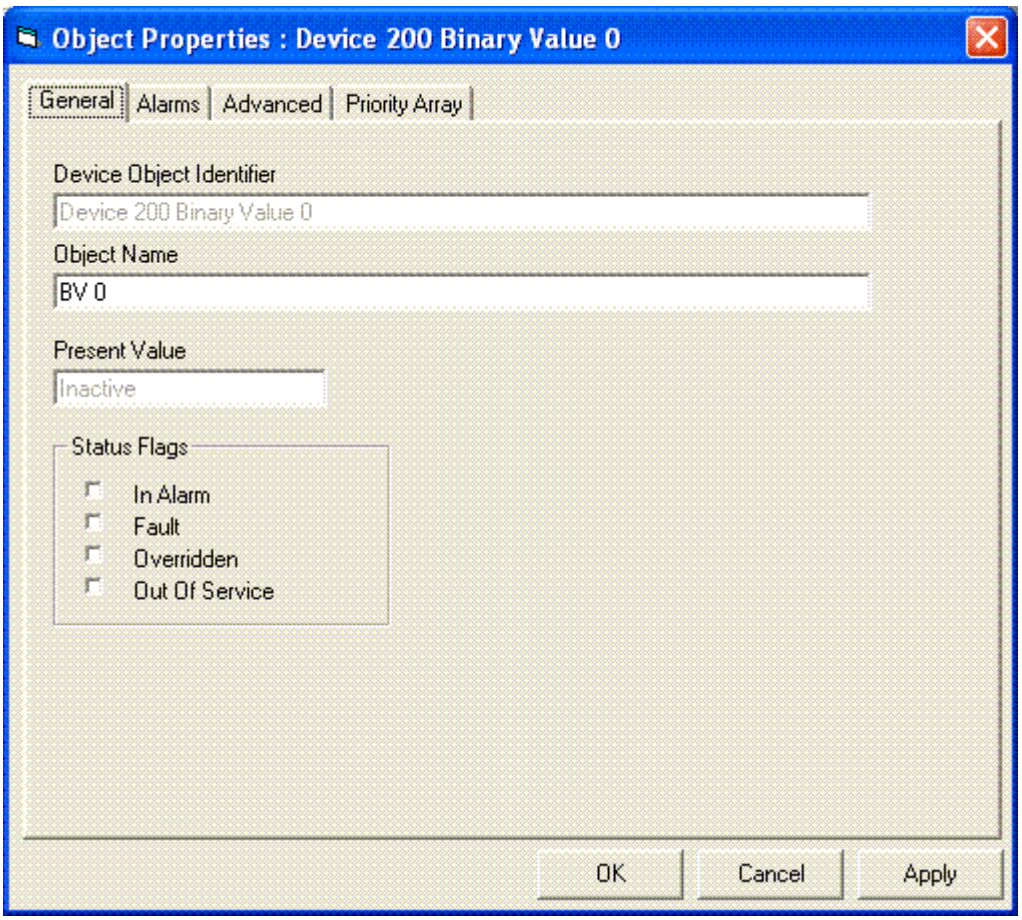
Once it is in the desired location, double click on the label to bring up the properties window as shown below. Using this dialog box, the address of the point can be changed, and the font properties can be changed also.



Changing back to display mode will display the real time data of the new point as shown below.



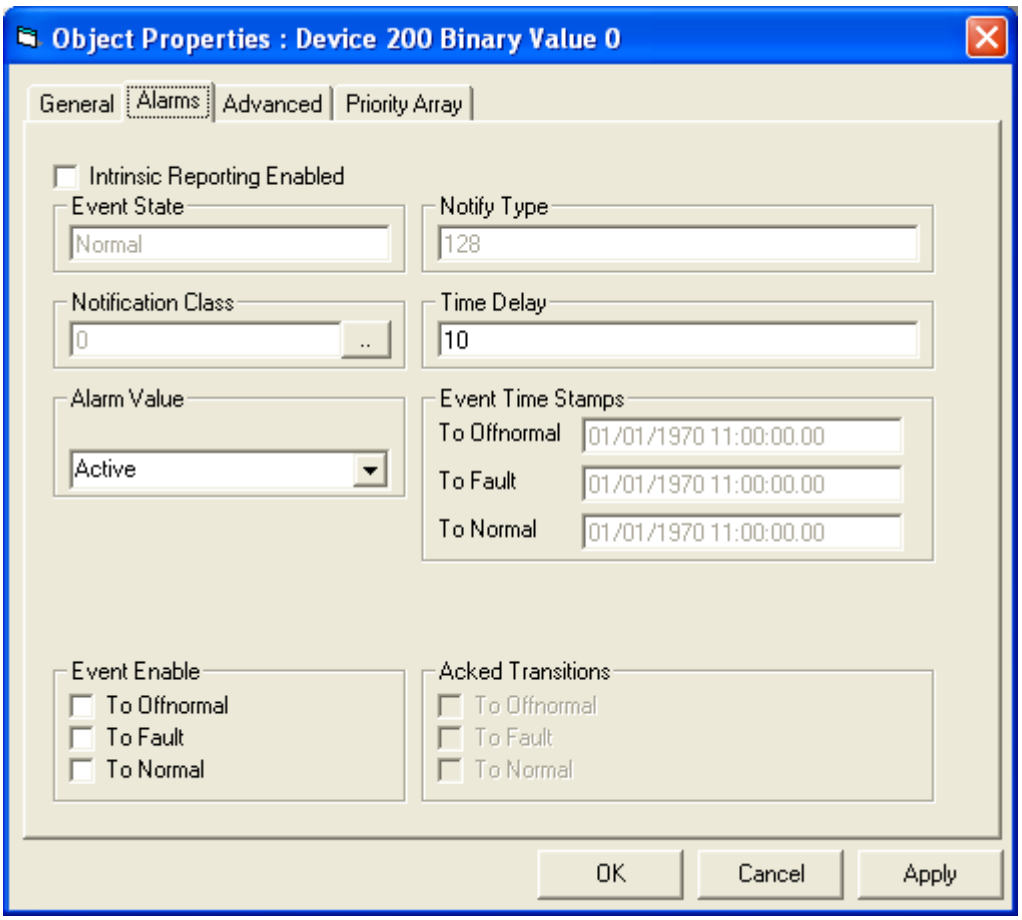
Double click on the point to display the point properties as shown below.



SCADA Engine How To Configure an Alarm

Most BACnet Vendors support intrinsic reporting for Real Time Data. Using this feature, alarms can be configured from the BACnet Operator Workstation.

To configure an alarm, double click on the point in display mode to bring up the following dialog box and select the alarms tab.



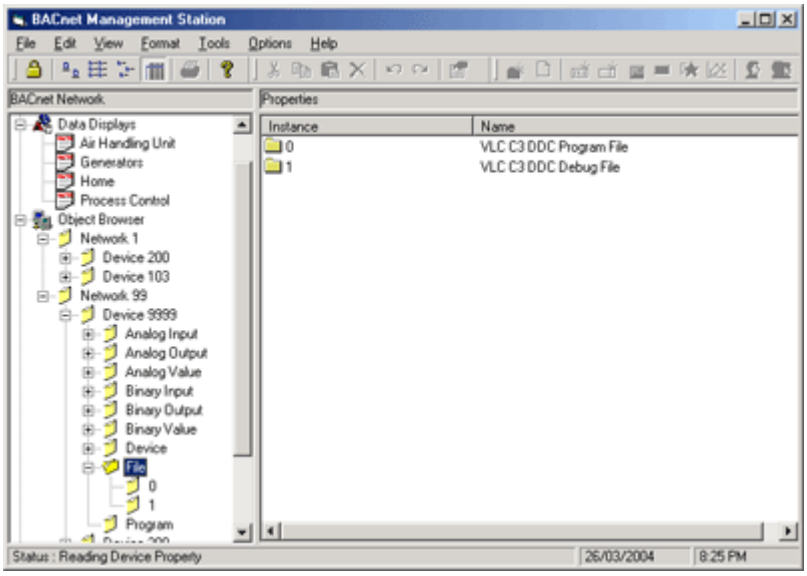
To activate intrinsic reporting, tick the checkbox. Once intrinsic reporting has been activated, the values can be edited.

Object Browser

The Object Browser is used to Navigate through the BACnet network and views all of the Objects within any device on the network. The Object Browser can also be used to edit objects within a device.

Object Browser Overview

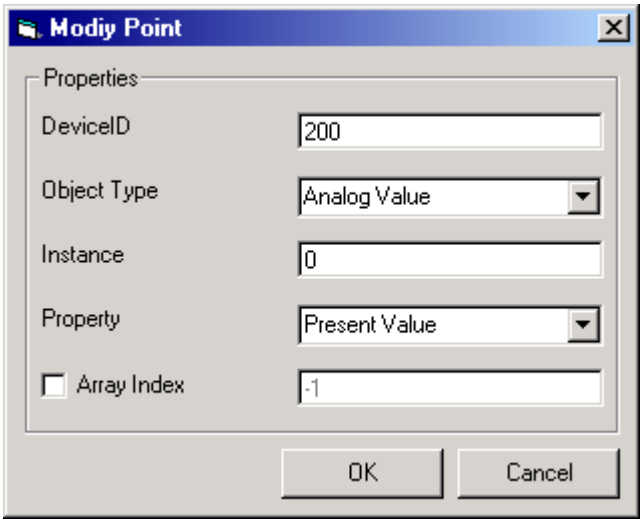
The BACnet Object Browser operates in a similar way to the explorer in Windows. From the Tree View, you can navigate through the BACnet Network. At the top of the screen is a toolbar that has buttons for Add/Edit and Deleting Objects, changing the list display, activating the device discovery and the Help file.



Object Property Reference

The Object Property Reference Dialog box is used to enter in a reference to another object in the network.

Object Property Reference Dialog box



Device ID

The Device ID of the Object to be referenced.

Object Type

The Object Type of the Object to be referenced.

Instance

The Instance of the Object to be referenced.

Property

The Property of the Object to be referenced.

Array Index

The Array Index of the Object to be referenced. Most properties are not array data types, and must have the array index unchecked. Only use the array index if the property is an array.

Browsing Objects

When the Operator Station starts, it issues a WhoIs command on the network to retrieve an Iam response from all devices on the network. For a large network, for a large network, the device discovery option is recommended to guarantee that all devices have responded to the WhoIs request. Some devices may contain a large quantity of BACnet Objects and it may take some time before the object list can be read.

Object Browser Functions

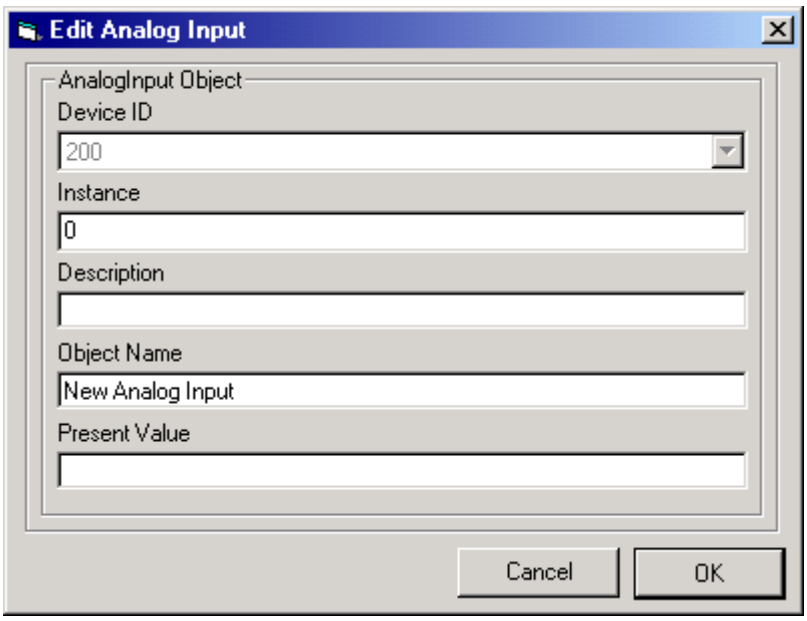
The Following Functions are available from the toolbar and top menu.

Device Discovery	Use the device discovery option to scan for all devices on the network. The device discovery may reveal more devices because it allows each device extra time to respond to the WhoIs request.
Configuration	The Object Browser can be configured to connect to the BACnet Server, BACnet XML Server or BACnet SOAP Server.
Add/Edit/Delete Analog Input	Adding, Editing and Deleting Analog Inputs is made possible from the Object Browser.
Add/Edit/Delete Analog Output	Adding, Editing and Deleting Analog Outputs is made possible from the Object Browser.
Add/Edit/Delete Analog Value	Adding, Editing and Deleting Analog Values is made possible from the Object Browser.
Add/Edit/Delete Binary Input	Adding, Editing and Deleting Binary Inputs is made possible from the Object Browser.
Add/Edit/Delete Binary Output	Adding, Editing and Deleting Binary Outputs is made possible from the Object Browser.

Add/Edit/Delete Binary Value	Adding, Editing and Deleting Binary Values is made possible from the Object Browser.
Add/Edit/Delete Calenda	Adding, Editing and Deleting Calendar Objects is made possible from the Object Browser.
Add/Edit/Delete Event Enrolment	Adding, Editing and Deleting EventEnrolment Objects is made possible from the Object Browser.
Add/Edit/Delete Multistate Input	Adding, Editing and Deleting Multistate Inputs is made possible from the Object Browser.
Add/Edit/Delete Multistate Output	Adding, Editing and Deleting Multistate Outputs is made possible from the Object Browser.
Add/Edit/Delete Multistate Value	Adding, Editing and Deleting Multistate Values is made possible from the Object Browser.
Add/Edit/Delete Notification Class	Adding, Editing and Deleting Notification Class Objects is made possible from the Object Browser.
Add/Edit/Delete Schedule	Adding, Editing and Deleting Schedule Objects is made possible from the Object Browser.
Add/Edit/Delete Trendlog	Adding, Editing and Deleting Trendlog Objects is made possible from the Object Browser.

Analog Input

To Add/Edit/Delete Analog Inputs, you must first navigate the Object Browser to the Analog Inputs section of the Device you wish to modify. Adding/Deleting Analog Inputs is not available for all devices, an error message will be generated for devices that do not support this feature. After navigating to the Inputs section, select the Add/Edit or Delete option from the pulldown menu. The Add/Edit/Delete options from the Toolbar could also be used. The Add/Edit options will display the following dialog box.



Instance

The Instance Property is an Unsigned Integer, which can be entered in if the **Add** option was selected. It can be changed if **Edit** was selected.

Description

The Description Property is a Character String that can be edited from this dialog box. Not all devices support this property, and an error message may be displayed when this property is edited.

Object Name

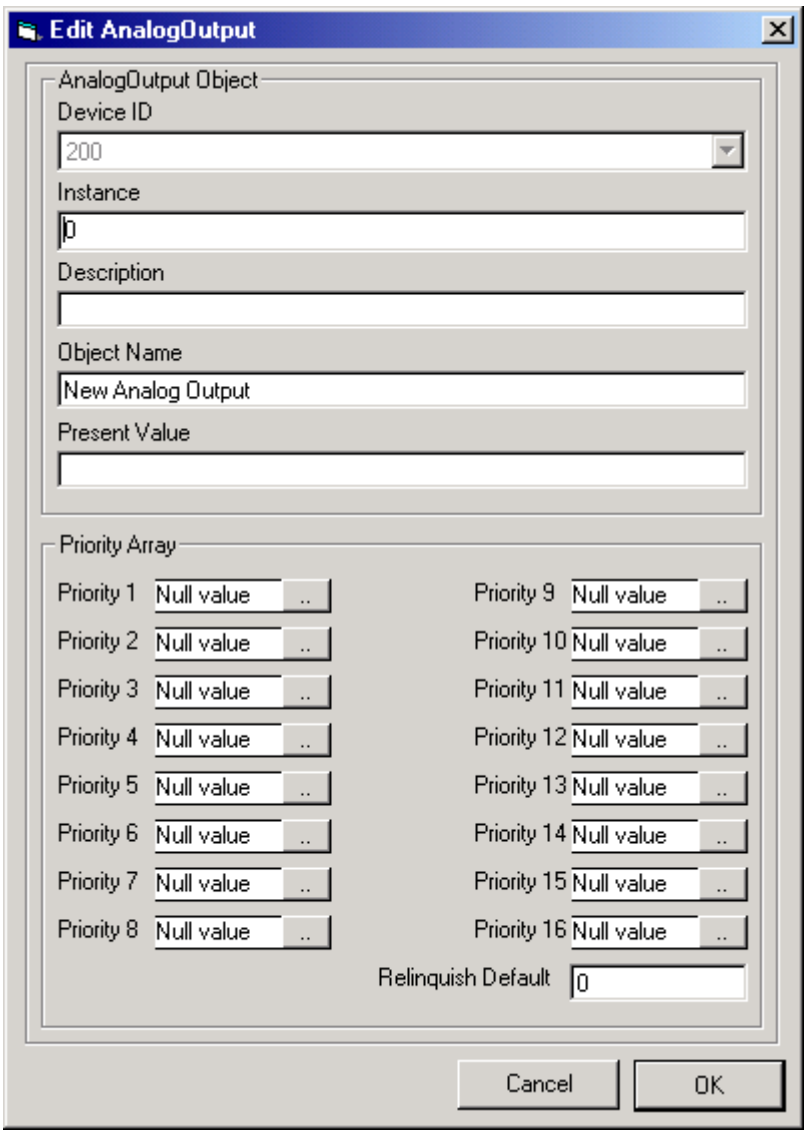
The Object Name Property is a Character String that can be edited from this dialog box.

Present Value

The Present Value Property is a Real data type that cannot be edited.

Analog Output

To Add/Edit/Delete Analog Outputs, you must first navigate the Object Browser to the Analog Outputs section of the Device you wish to modify. Adding/Deleting Analog Outputs is not available for all devices, an error message will be generated for devices that do not support this feature. After navigating to the Outputs section, select the Add/Edit or Delete option from the pulldown menu. The Add/Edit/Delete options from the Toolbar could also be used. The Add/Edit options will display the following dialog box.



Instance

The Instance Property is an Unsigned Integer, which can be entered in if the **Add** option was selected. It can be changed if **Edit** was selected.

Description

The Description Property is a Character String that can be edited from this dialog box. Not all devices support this property, and an error message may be displayed when this property is edited.

Object Name

The Object Name Property is a Character String that can be edited from this dialog box.

Priority Array

The priority array consists of 16 values. If any of these values is not null, then the lowest priority index will be used for the Present Value of the Object. Most systems allow an operator to write to priority 8. Each priority is editable via the dialog. Not all devices support the Priority Array.

Relinquish

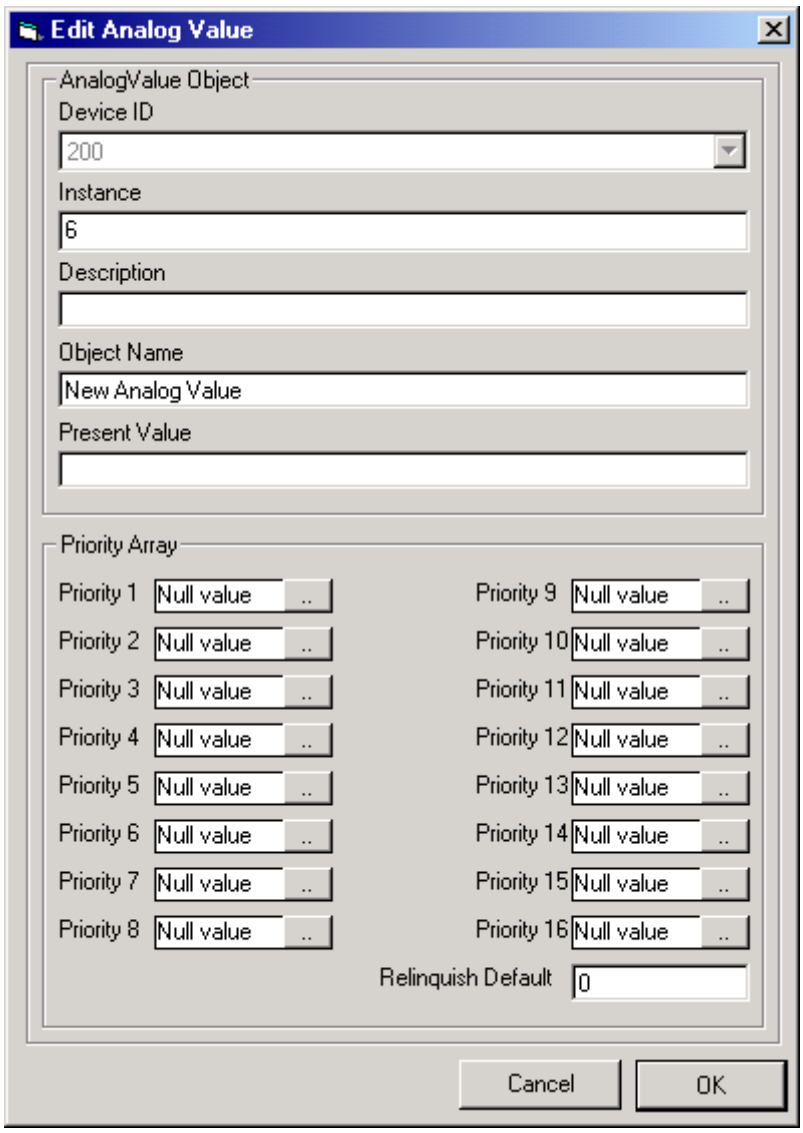
The relinquish default is the value that will be used for the present value, if all values of the priority array are null. Not all devices support the Priority Array.

Present Value

The Present Value Property is a Real data type that cannot be edited.

Analog Value

To Add/Edit/Delete Analog Values, you must first navigate the Object Browser to the Analog Values section of the Device you wish to modify. Adding/Deleting Analog Values is not available for all devices, an error message will be generated for devices that do not support this feature. After navigating to the Values section, select the Add/Edit or Delete option from the pulldown menu. The Add/Edit/Delete options from the Toolbar could also be used. The Add/Edit options will display the following dialog box.



Instance

The Instance Property is an Unsigned Integer, which can be entered in if the **Add** option was selected. It can be changed if **Edit** was selected.

Description

The Description Property is a Character String that can be edited from this dialog box. Not all devices support this property, and an error message may be displayed when this property is edited.

Object Name

The Object Name Property is a Character String that can be edited from this dialog box.

Priority Array

The priority array consists of 16 values. If any of these values is not null, then the lowest priority index will be used for the Present Value of the Object. Most systems allow an operator to write to priority 8. Each priority is editable via the dialog. Not all devices support the Priority Array.

Relinquish

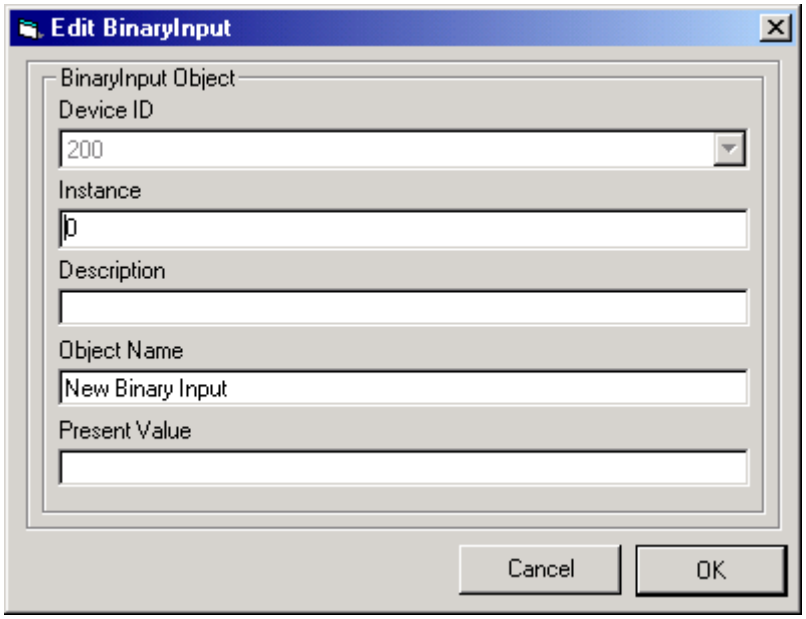
The relinquish default is the value that will be used for the present value, if all values of the priority array are null. Not all devices support the Priority Array.

Present Value

The Present Value Property is a Real data type that cannot be edited.

Binary Input

To Add/Edit/Delete Binary Inputs, you must first navigate the Object Browser to the Binary Inputs section of the Device you wish to modify. Adding/Deleting Binary Inputs is not available for all devices, an error message will be generated for devices that do not support this feature. After navigating to the Inputs section, select the Add/Edit or Delete option from the pulldown menu. The Add/Edit/Delete options from the Toolbar could also be used. The Add/Edit options will display the following dialog box.



Instance

The Instance Property is an Unsigned Integer, which can be entered in if the **Add** option was selected. It can be changed if **Edit** was selected.

Description

The Description Property is a Character String that can be edited from this dialog box. Not all devices support this property, and an error message may be displayed when this property is edited.

Object Name

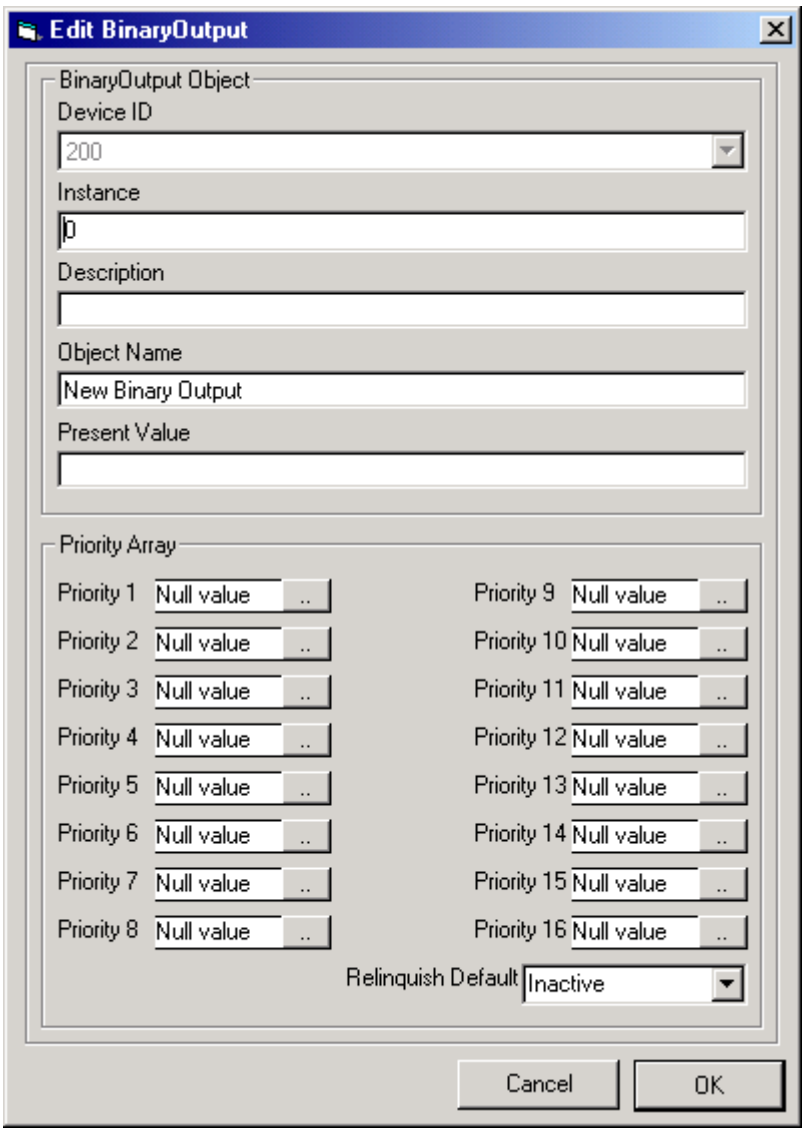
The Object Name Property is a Character String that can be edited from this dialog box.

Present Value

The Present Value Property is a Real data type that cannot be edited.

Binary Output

To Add/Edit/Delete Binary Outputs, you must first navigate the Object Browser to the Binary Outputs section of the Device you wish to modify. Adding/Deleting Binary Outputs is not available for all devices, an error message will be generated for devices that do not support this feature. After navigating to the Outputs section, select the Add/Edit or Delete option from the pulldown menu. The Add/Edit/Delete options from the Toolbar could also be used. The Add/Edit options will display the following dialog box.



Instance

The Instance Property is an Unsigned Integer, which can be entered in if the **Add** option was selected. It can be changed if **Edit** was selected.

Description

The Description Property is a Character String that can be edited from this dialog box. Not all devices support this property, and an error message may be displayed when this property is edited.

Object Name

The Object Name Property is a Character String that can be edited from this dialog box.

Priority Array

The priority array consists of 16 values. If any of these values is not null, then the lowest priority index will be used for the Present Value of the Object. Most systems allow an operator to write to priority 8. Each priority is editable via the dialog. Not all devices support the Priority Array.

Relinquish

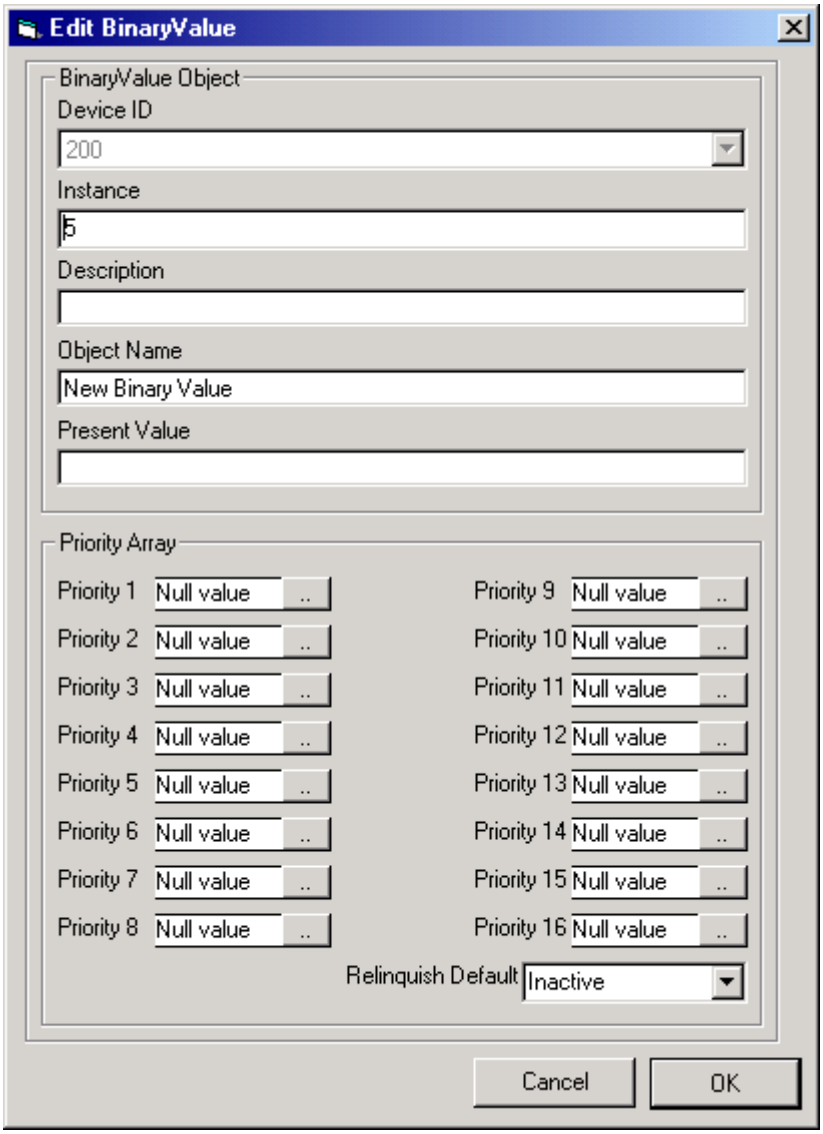
The relinquish default is the value that will be used for the present value, if all values of the priority array are null. Not all devices support the Priority Array.

Present Value

The Present Value Property is a Real data type that cannot be edited.

Binary Value

To Add/Edit/Delete Binary Values, you must first navigate the Object Browser to the Binary Values section of the Device you wish to modify. Adding/Deleting Binary Values is not available for all devices, an error message will be generated for devices that do not support this feature. After navigating to the Values section, select the Add/Edit or Delete option from the pulldown menu. The Add/Edit/Delete options from the Toolbar could also be used. The Add/Edit options will display the following dialog box.



Instance

The Instance Property is an Unsigned Integer, which can be entered in if the **Add** option was selected. It can be changed if **Edit** was selected.

Description

The Description Property is a Character String that can be edited from this dialog box. Not all devices support this property, and an error message may be displayed when this property is edited.

Object Name

The Object Name Property is a Character String that can be edited from this dialog box.

Priority Array

The priority array consists of 16 values. If any of these values is not null, then the lowest priority index will be used for the Present Value of the Object. Most systems allow an operator to write to priority 8. Each priority is editable via the dialog. Not all devices support the Priority Array.

Relinquish

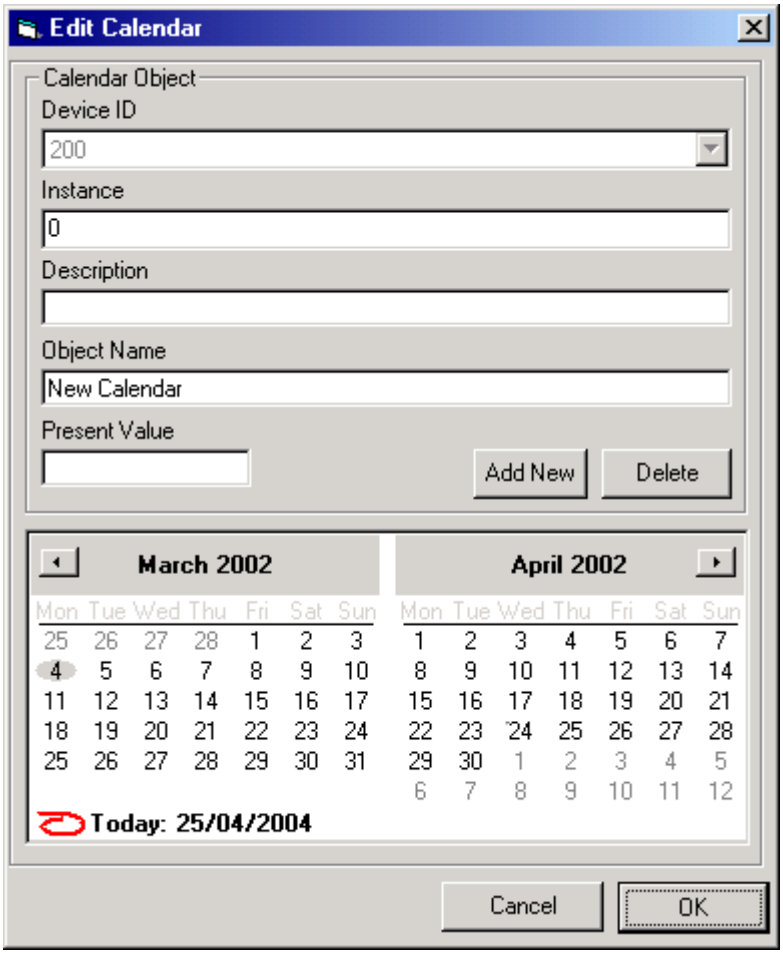
The relinquish default is the value that will be used for the present value, if all values of the priority array are null. Not all devices support the Priority Array.

Present Value

The Present Value Property is a Real data type that cannot be edited.

Calendar

To Add/Edit/Delete Calendar Objects, you must first navigate the Object Browser to the Calendar section of the Device you wish to modify. Adding/Deleting Calendar Objects is not available for all devices, an error message will be generated for devices that do not support this feature. After navigating to the Calendar section, select the Add/Edit or Delete option from the pulldown menu. The Add/Edit/Delete options from the Toolbar could also be used. The Add/Edit options will display the following dialog box.



Instance

The Instance Property is an Unsigned Integer, which can be entered in if the **Add** option was selected. It can be changed if **Edit** was selected.

Description

The Description Property is a Character String that can be edited from this dialog box. Not all devices support this property, and an error message may be displayed when this property is edited.

Object Name

The Object Name Property is a Character String that can be edited from this dialog box.

Present Value

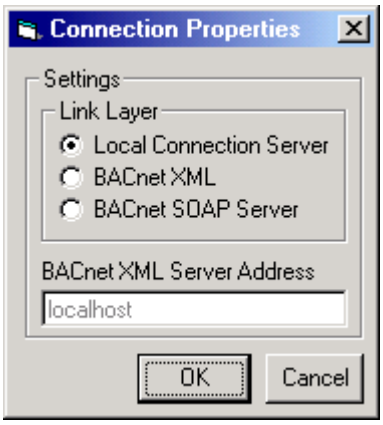
The Present Value Property is a Real data type that cannot be edited.

Date List

The Date List is represented in the Calendar section of the Dialog Box. Dates can be selected by double clicking on a date, once selected they appear in bold.

Configuration

The BACnet Object Browser can connect to the BACnet Server in one of three ways. The connection type can be selected from the Options menu which displays the following dialog box.



Local Connection

The local connection option will make a direct connection into the BACnet Server and is the method used by default.

BACnet XML Server

This option allows for a connection to the BACnet XML Server. The server can be located anywhere on the network. This is normally used for the Linux solution as a way of connecting into the BACnet Network.

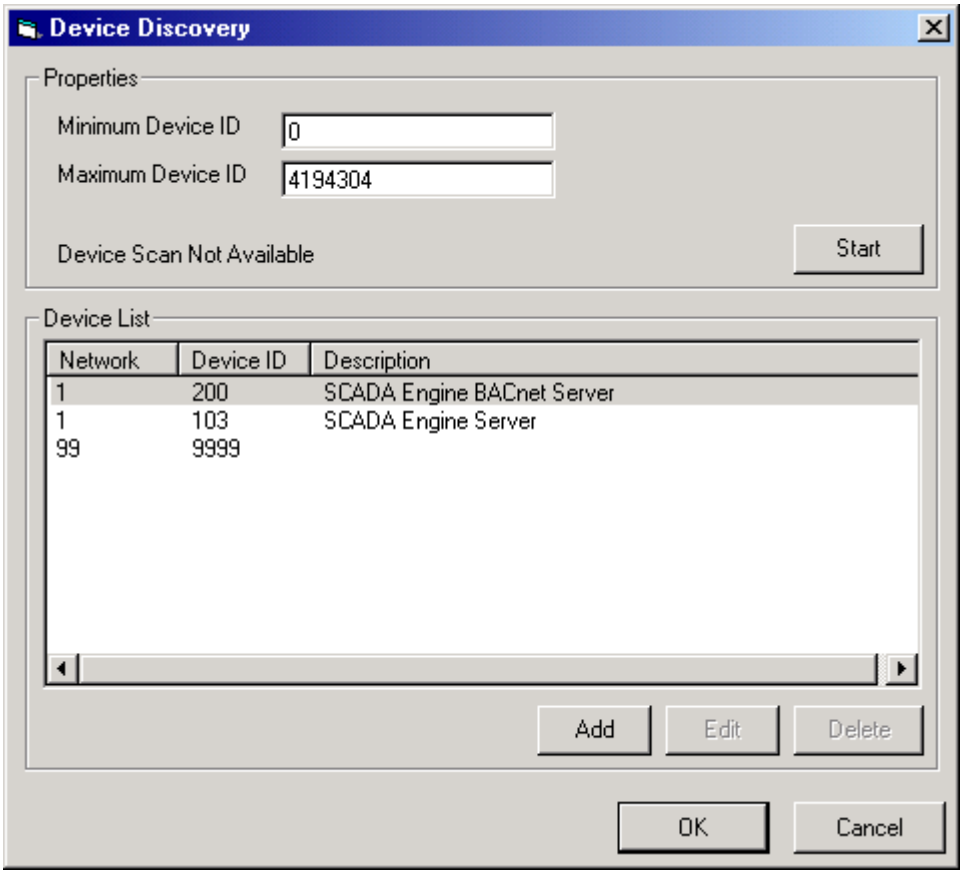
BACnet SOAP Server

This option allows for a connection to the BACnet SOAP Server. The server can be located anywhere on the network. This is normally used by the Web Server solution; the BACnet Object Browser can make a connection over the Intranet/Internet to browse the BACnet network.

The BACnet SOAP server is not installed with the BACnet RDK, it can be requested by contacting support@scadaengine.com.

Device Discovery

From the Pulldown Menu, select the "Device Discovery" option and the following dialog will be shown. There is also a toolbar button that will also display this dialog box.



Device Scan

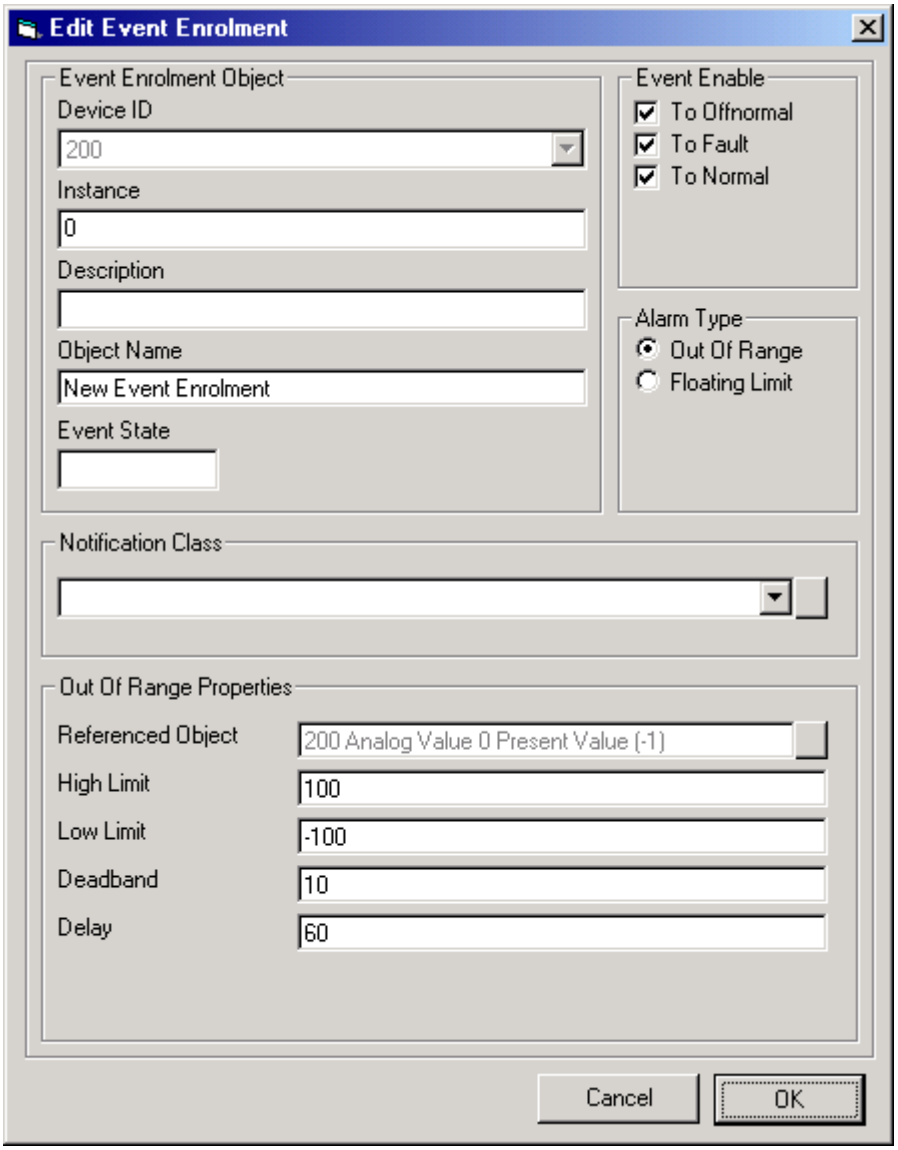
The Device **High Limit** and **Low Limit** textbox must be entered. By default, the Highest and Lowest possible Device ID's on the network will be searched. You can use this option to restrict the search to narrow range of Device ID's. To start the device Scan, press the **Start** button.

Static Binding

It is also possible to Add/Edit/Delete Devices on the network. This option allows for the MAC address of the device to be statically configured in the BACnet Server.

Event Enrolment

To Add/Edit/Delete Event Enrolment Objects, you must first navigate the Object Browser to the Event Enrolments section of the Device you wish to modify. Adding/Deleting Event Enrolment Objects is not available for all devices, an error message will be generated for devices that do not support this feature. After navigating to the Event Enrolment section, select the Add/Edit or Delete option from the pulldown menu. The Add/Edit/Delete options from the Toolbar could also be used. The Add/Edit options will display the following dialog box.



Instance

The Instance Property is an Unsigned Integer, which can be entered in if the **Add** option was selected. It can be changed if **Edit** was selected.

Description

The Description Property is a Character String that can be edited from this dialog box. Not all devices support this property, and an error message may be displayed when this property is edited.

Object Name

The Object Name Property is a Character String that can be edited from this dialog box.

Event State

The Event State Property is an Enumerated data type that cannot be edited.

Notification Class Object

The Notification Class Property is an Unsigned Integer that is a reference to a Notification Class Object. A Notification Class object must be selected from the list, which will be empty if no Notification Class Objects exist on the device. A new notification class can be created by selecting the ellipse button to the right of the list box.

Alarm Type

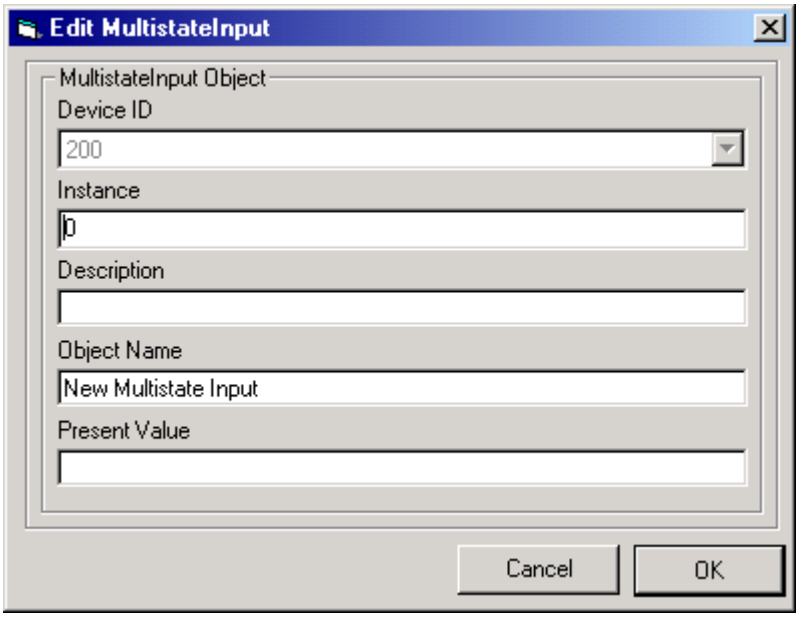
The Alarm Type radio button is dependent on the referenced object. For Analog points, the options are for **Out Of Range** and for **Floating Limit**. For Binary points, the options are for **Change Of State** and for **Command Failure**.

Referenced Object

The referenced object is the object that is used to generate an event. The Event Enrolment Object will read from the referenced object and initiate an event of the conditions are met. The ellipse button following next to the textbox will bring up the Object Property Reference Dialog box.

Multistate Input

To Add/Edit/Delete Multistate Inputs, you must first navigate the Object Browser to the Multistate Inputs section of the Device you wish to modify. Adding/Deleting Multistate Inputs is not available for all devices; an error message will be generated for devices that do not support this feature. After navigating to the Inputs section, select the Add/Edit or Delete option from the pulldown menu. The Add/Edit/Delete options from the Toolbar could also be used. The Add/Edit options will display the following dialog box.



Instance

The Instance Property is an Unsigned Integer, which can be entered in if the **Add** option was selected. It can be changed if **Edit** was selected.

Description

The Description Property is a Character String that can be edited from this dialog box. Not all devices support this property, and an error message may be displayed when this property is edited.

Object Name

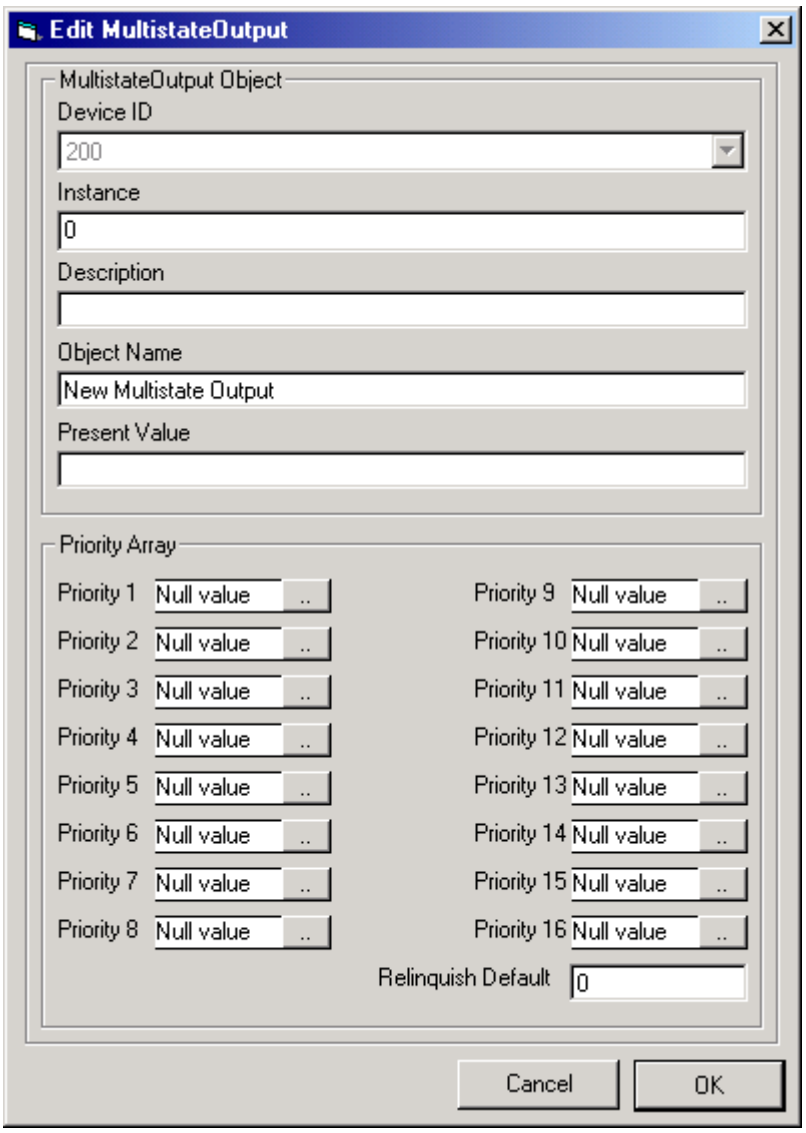
The Object Name Property is a Character String that can be edited from this dialog box.

Present Value

The Present Value Property is a Real data type that cannot be edited.

Multistate Output

To Add/Edit/Delete Multistate Outputs, you must first navigate the Object Browser to the Multistate Outputs section of the Device you wish to modify. Adding/Deleting Multistate Outputs is not available for all devices; an error message will be generated for devices that do not support this feature. After navigating to the Outputs section, select the Add/Edit or Delete option from the pulldown menu. The Add/Edit/Delete options from the Toolbar could also be used. The Add/Edit options will display the following dialog box.



Instance

The Instance Property is an Unsigned Integer, which can be entered in if the **Add** option was selected. It can be changed if **Edit** was selected.

Description

The Description Property is a Character String that can be edited from this dialog box. Not all devices support this property, and an error message may be displayed when this property is edited.

Object Name

The Object Name Property is a Character String that can be edited from this dialog box.

Priority Array

The priority array consists of 16 values. If any of these values is not null, then the lowest priority index will be used for the Present Value of the Object. Most systems allow an operator to write to priority 8. Each priority is editable via the dialog. Not all devices support the Priority Array.

Relinquish

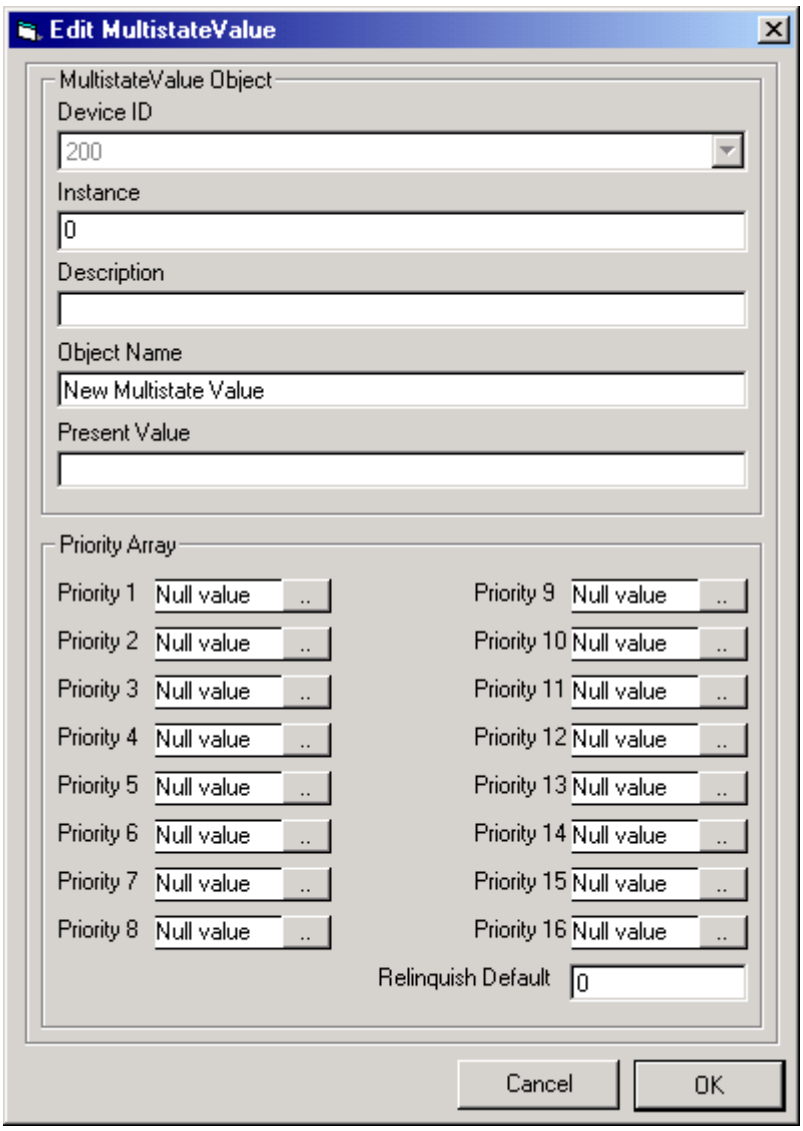
The relinquish default is the value that will be used for the present value, if all values of the priority array are null. Not all devices support the Priority Array.

Present Value

The Present Value Property is a Real data type that cannot be edited.

Multistate Value

To Add/Edit/Delete Multistate Values, you must first navigate the Object Browser to the Multistate Values section of the Device you wish to modify. Adding/Deleting Multistate Values is not available for all devices; an error message will be generated for devices that do not support this feature. After navigating to the Values section, select the Add/Edit or Delete option from the pulldown menu. The Add/Edit/Delete options from the Toolbar could also be used. The Add/Edit options will display the following dialog box.



Instance

The Instance Property is an Unsigned Integer, which can be entered in if the **Add** option was selected. It can be changed if **Edit** was selected.

Description

The Description Property is a Character String that can be edited from this dialog box. Not all devices support this property, and an error message may be displayed when this property is edited.

Object Name

The Object Name Property is a Character String that can be edited from this dialog box.

Priority Array

The priority array consists of 16 values. If any of these values is not null, then the lowest priority index will be used for the Present Value of the Object. Most systems allow an operator to write to priority 8. Each priority is editable via the dialog. Not all devices support the Priority Array.

Relinquish

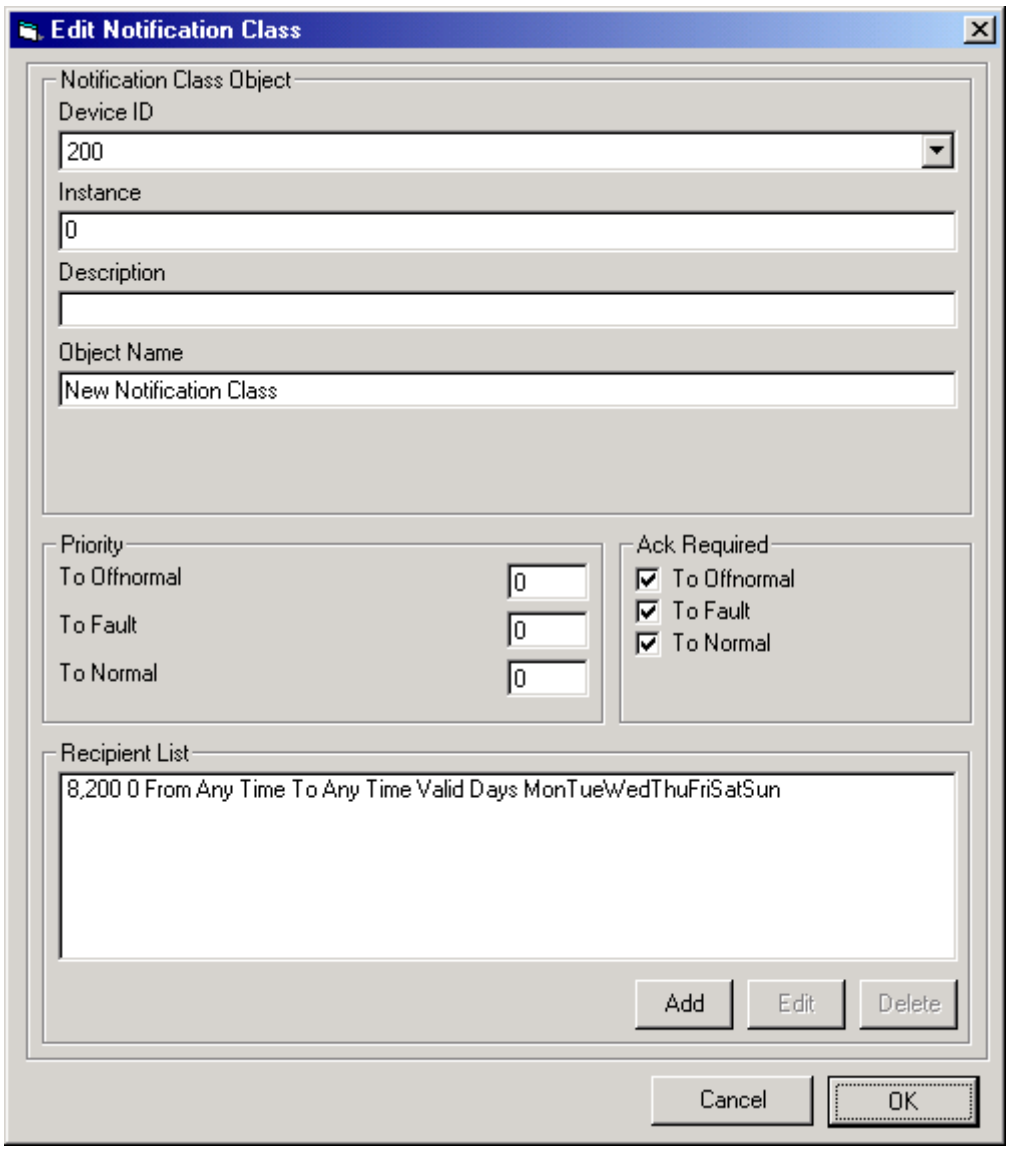
The relinquish default is the value that will be used for the present value, if all values of the priority array are null. Not all devices support the Priority Array.

Present Value

The Present Value Property is a Real data type that cannot be edited.

Notification Class

To Add/Edit/Delete Notification Class Objects, you must first navigate the Object Browser to the Notification Class section of the Device you wish to modify. Adding/Deleting Notification Class Objects is not available for all devices, an error message will be generated for devices that do not support this feature. After navigating to the Inputs section, select the Add/Edit or Delete option from the pulldown menu. The Add/Edit/Delete options from the Toolbar could also be used. The Add/Edit options will display the following dialog box.



Instance

The Instance Property is an Unsigned Integer, which can be entered in if the **Add** option was selected. It can be changed if **Edit** was selected.

Description

The Description Property is a Character String that can be edited from this dialog box. Not all devices support this property, and an error message may be displayed when this property is edited.

Object Name

The Object Name Property is a Character String that can be edited from this dialog box.

Priority

The priority for **To Fault**, **To Normal** and **To Offnormal** transitions can be edited from the dialog box.

Ack Required

The Ack Required Option for **To Fault**, **To Normal** and **To Offnormal** transitions can be selected from the dialog box.

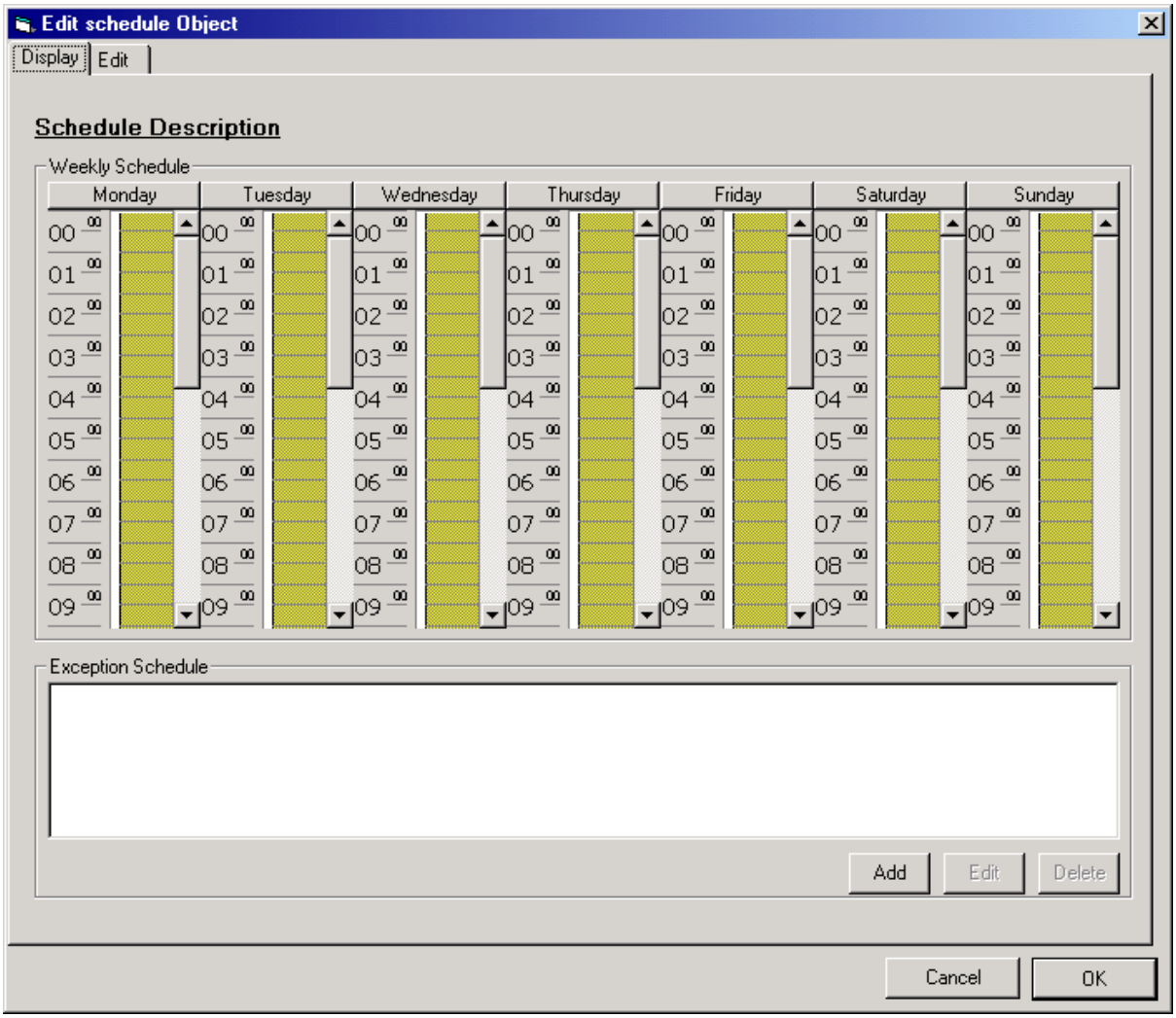
Recipient List

The Recipient List is used by the notification Class Object to determine where the events will be sent to. Recipients can be Added, Edited and Deleted by selecting the appropriate button under the Recipient List Box.

Schedule

To Add/Edit/Delete Schedule Objects, you must first navigate the Object Browser to the Schedules section of the Device you wish to modify. Adding/Deleting Schedule Objects is not available for all devices, an error message will be generated for devices that do not support this feature. After navigating to the Schedules section, select the Add/Edit or Delete option from the pulldown menu. The Add/Edit/Delete options from the Toolbar could also be used. The Add/Edit options will display the following dialog box.

Display Tab



Weekly Schedule

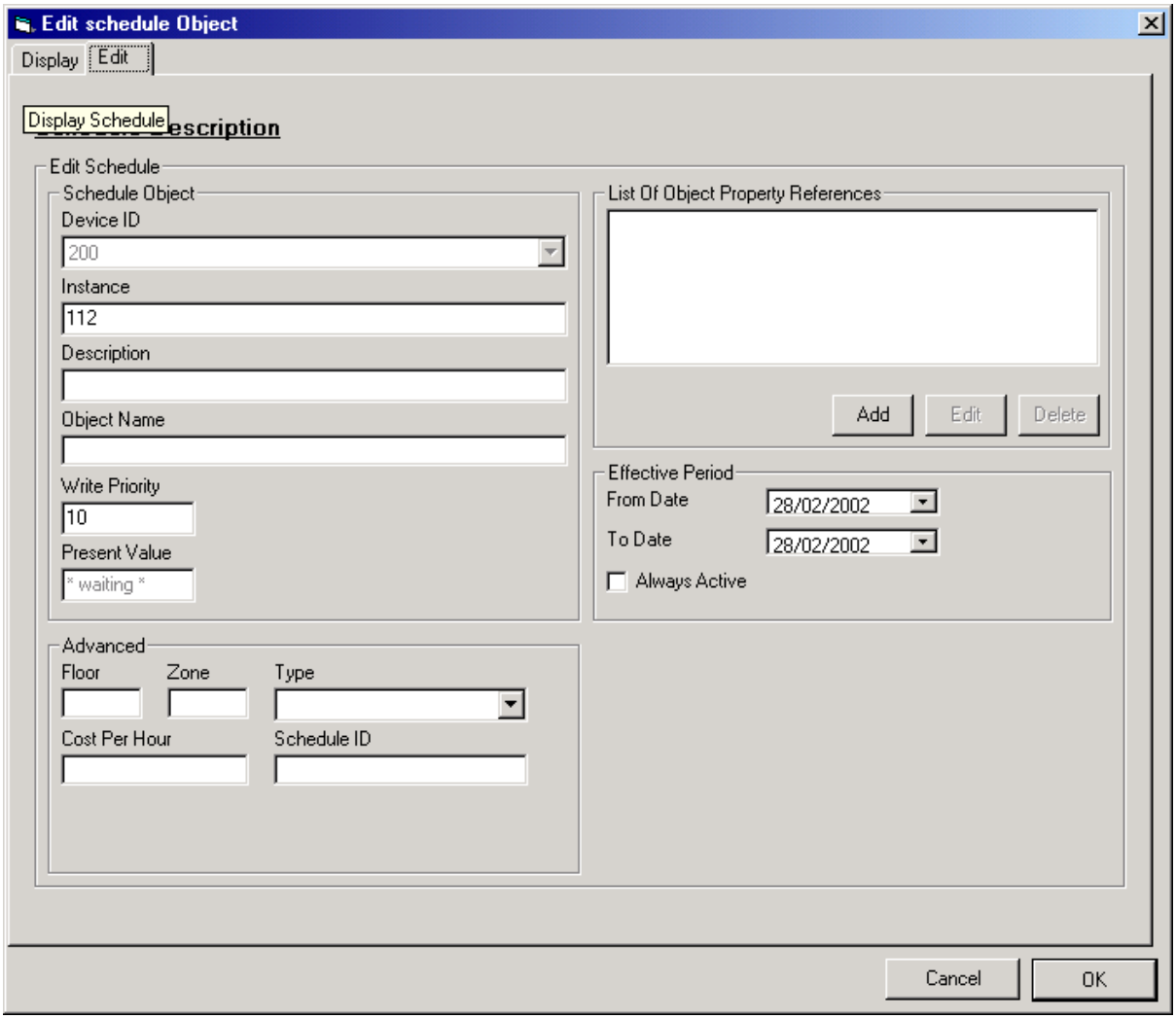
The Weekly Schedule is represented by an **Outlook** style control for each of the 7 days in the week. New Day Schedules can be added by selecting the Day Button at the top of the control for the day to be edited. Double Clicking on a Day Schedule will enable it to be edited.

Exception Schedules

The Exception Schedule is represented by the list box below the Weekly Schedule. Exception Schedules can be Added/Edited/Deleted by selecting the appropriate button. The Add/Edit options will bring up the following display for the Special Event Dialog box.

Edit Tab

To change to design mode, select the tab marked Design to see the following.



Weekly Schedule

The Instance Property is an Unsigned Integer, which can be entered in if the Add option was selected. It can be changed if Edit was selected.

Description

The Description Property is a Character String that can be edited from this dialog box. Not all devices support this property, and an error message may be displayed when this property is edited.

Object Name

The Object Name Property is a Character String that can be edited from this dialog box.

Present Value

The Present Value Property is a Real data type that cannot be edited.

List Of Object Property References

The List Of Object Property references is used by the Schedule Object to control the objects in the list. All Objects in the list will be written to by the Schedule Object. The List Of Object Property is represented by an the list box. Object References can be Added/Edited/Deleted by selecting the appropriate button. The Add/Edit options will bring up the following display for the Object Property Reference Dialog box.

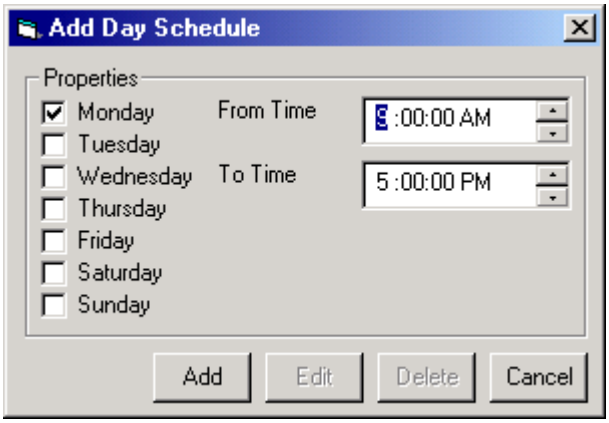
Effective Date

The effective date for the Schedule Object can be edited via the dialog box.

Advanced Properties

The Advanced properties are specific to the SCADA Engine BACnet Server and are used by the Interactive Voice Response (IVR) system only. These properties are used to create a reference to a Schedule Object, and for calculating usage costs.

Day Schedule

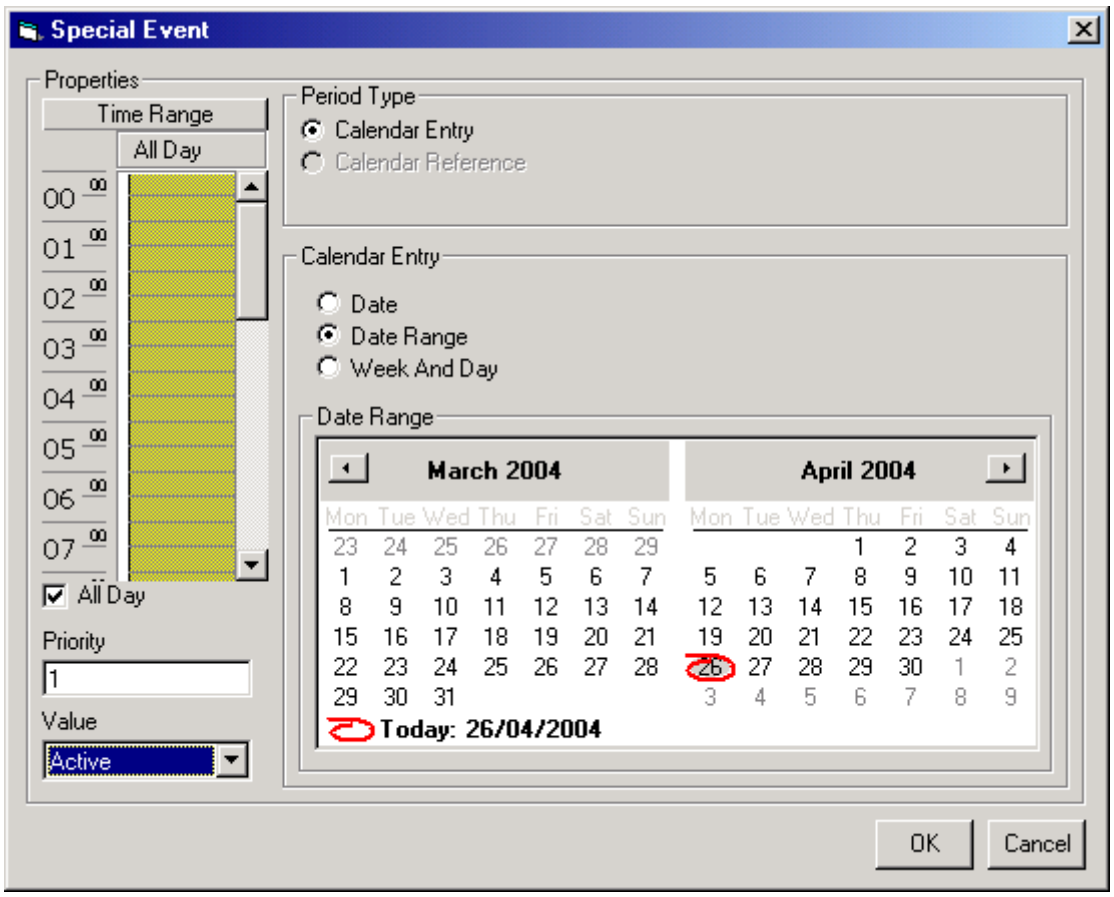


To Add a Day Schedule, select the Days for which the Day Schedule should be added, and then enter in an Off and On Time.

Special Event

The Special Event Dialog box is displayed when you try to Add or Edit an Exception Schedule. Exception Schedules are used to override the Weekly Schedule when special conditions are met. They can be used for Holidays, After Hours requests etc.

Special Event Dialog Box



Time Range

The Time range button allows you to enter in a Time Range for which the Special Event will activate. The **All Day** checkbox can be used if the entire day is required.

Priority

The Priority is used by the Schedule Object to determine which Special Event takes priority if they are overlap.

Value

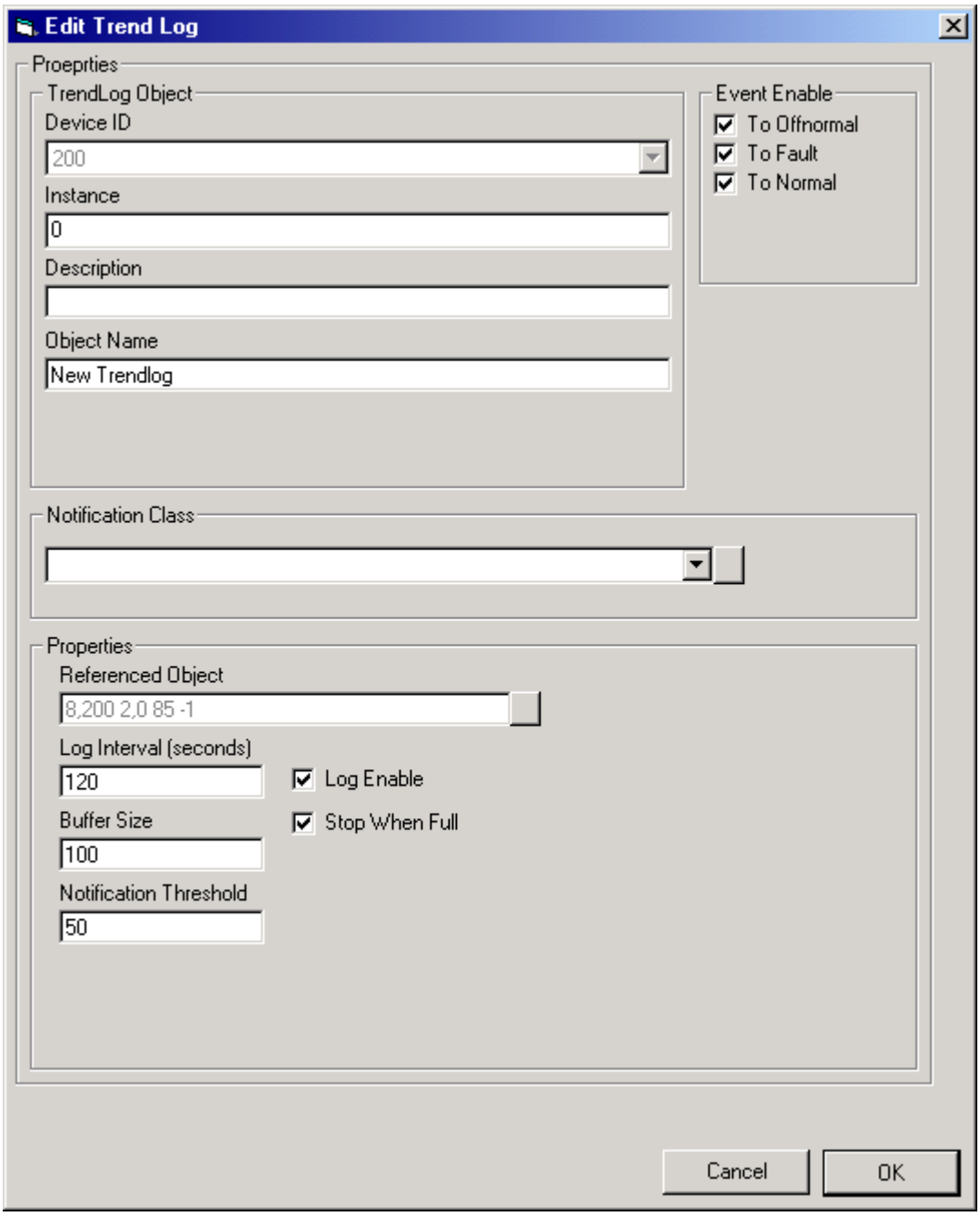
The Value is used by the Schedule to write to the all of the Objects in the List Of Object Property References when the Special Event activates.

Period Type

The Period Type can be a Calendar Enter or a Calendar Reference. A Calendar Entry is can be one or more dates from the Calendar. A Calendar Reference is a reference to a Calendar Object.

Trendlog

To Add/Edit/Delete Trendlog Objects, you must first navigate the Object Browser to the Trendlog section of the Device you wish to modify. Adding/Deleting Trendlog Objects is not available for all devices, an error message will be generated for devices that do not support this feature. After navigating to the Trendlog section, select the Add/Edit or Delete option from the pulldown menu. The Add/Edit/Delete options from the Toolbar could also be used. The Add/Edit options will display the following dialog box.



Instance

The Instance Property is an Unsigned Integer, which can be entered in if the **Add** option was selected. It can be changed if **Edit** was selected.

Description

The Description Property is a Character String that can be edited from this dialog box. Not all devices support this property, and an error message may be displayed when this property is edited.

Object Name

The Object Name Property is a Character String that can be edited from this dialog box.

Notification Class Object

The Notification Class Property is an Unsigned Integer that is a reference to a Notification Class Object. A Notification Class object must be selected from the list, which will be empty if no Notification Class Objects exist on the device. A new notification class can be created by selecting the ellipse button to the right of the list box.

Referenced Object

The Referenced Object is used by the Trendlog Object for taking samples. The Trendlog will read from the referenced object and store the value at intervals. The ellipse button following next to the textbox will bring up the Object Property Reference Dialog box.

Log Interval

The Log Interval determines how often samples will be taken.

Log Enable

If Active, the Trendlog will take samples.

Stop When Full

If Active, the Trendlog will stop when full.

Buffer Size

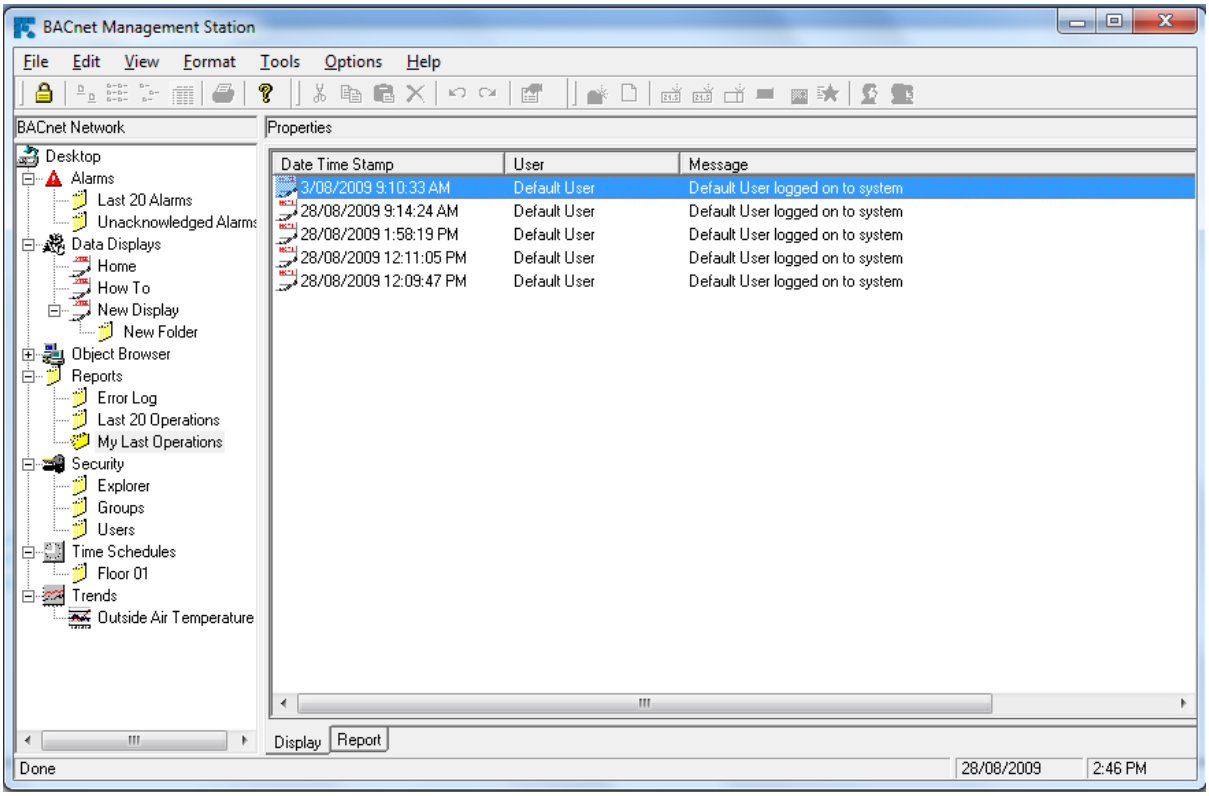
An Unsigned Integer that indicates how many samples can be taken by the Trendlog object.

Notification Threshold

An unsigned integer that indicates when a notification message will be sent.

Reports

In the Reports section, all error log and operation reports can be view in a list and printed out if required.

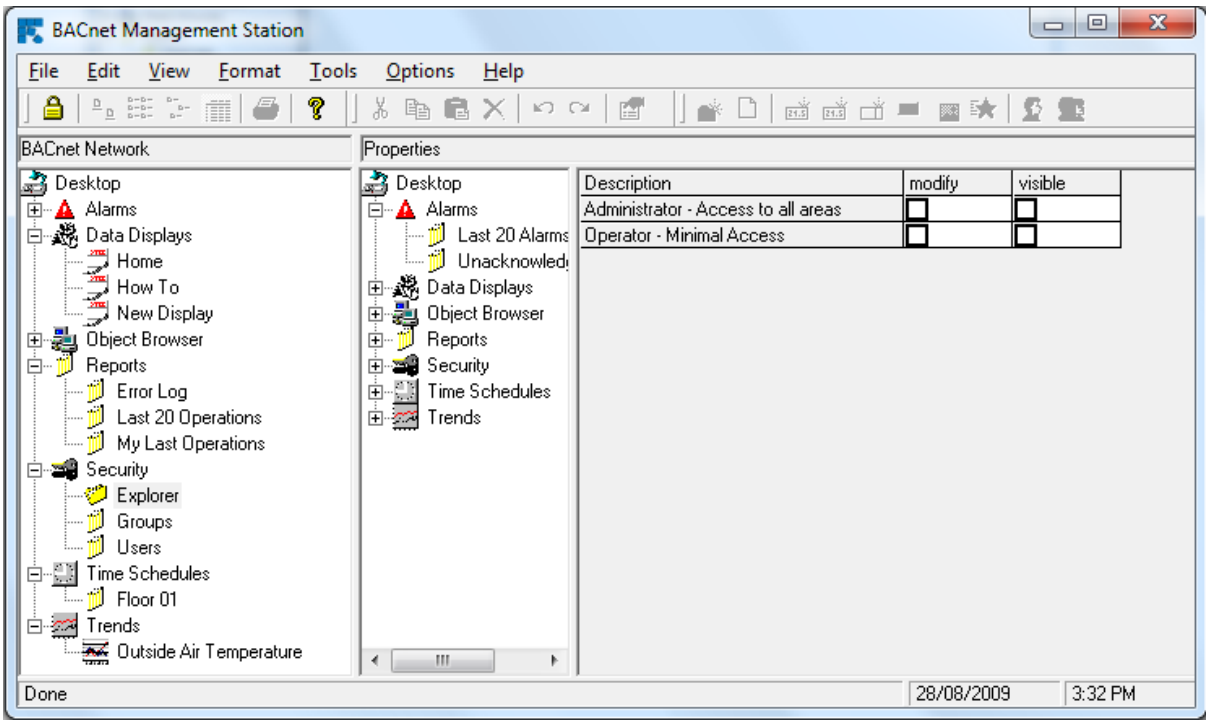


Security

The Security section is used to view and manage all of groups and users on the network. It can also be used to Add/Edit/Delete group and user and set the access property.

Explorer

The explorer is used to set the access property for group member.



modify

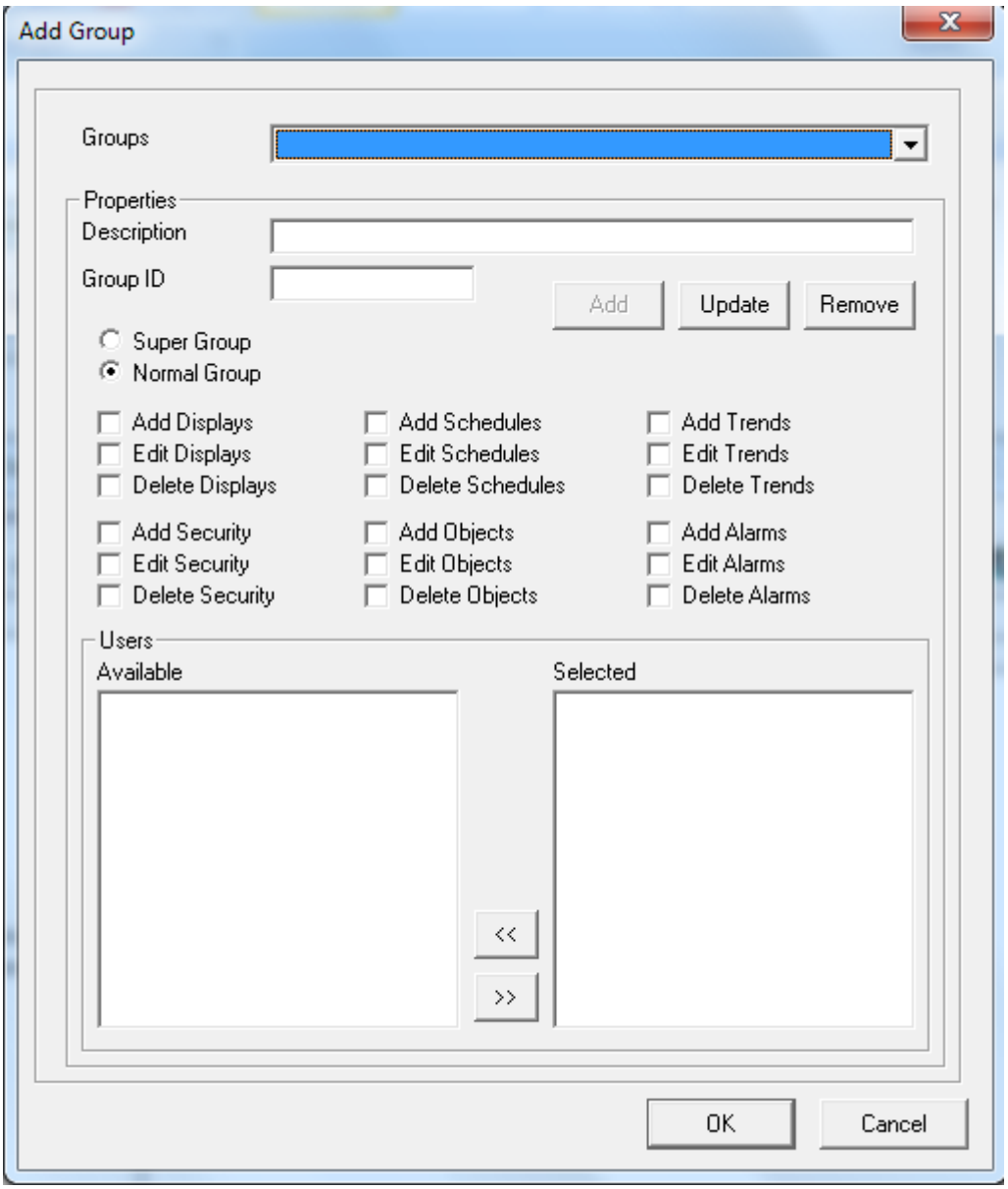
If Active, the group can modify the reference.

visible

If Active, the reference is visible to the group.

Groups

The Groups section is used to list and manage all of groups. It can also be used to Add/Edit/Delete group member. Groups appear in the BACnet Operator Workstation on the right hand side of the window. To Add/Edit/Delete a group, you must first navigate the Security to the Groups section you wish to modify. After navigating to the Groups section, select the Add/Edit or Delete option from the pulldown menu. The Add/Edit/Delete Group options from the Toolbar could also be used. The Add/Edit options will display the following dialog box.



Groups

The Groups to be referenced.

Description

The Description Property is a Character String that can be edited from this dialog box. Not all devices support this property, and an error message may be displayed when this property is edited.

Group ID

The Group ID Property is a Character String that can be edited from this dialog box.

Super Group

Super Group can access all properties.

Normal Group

Normal Group can access some properties you choose.

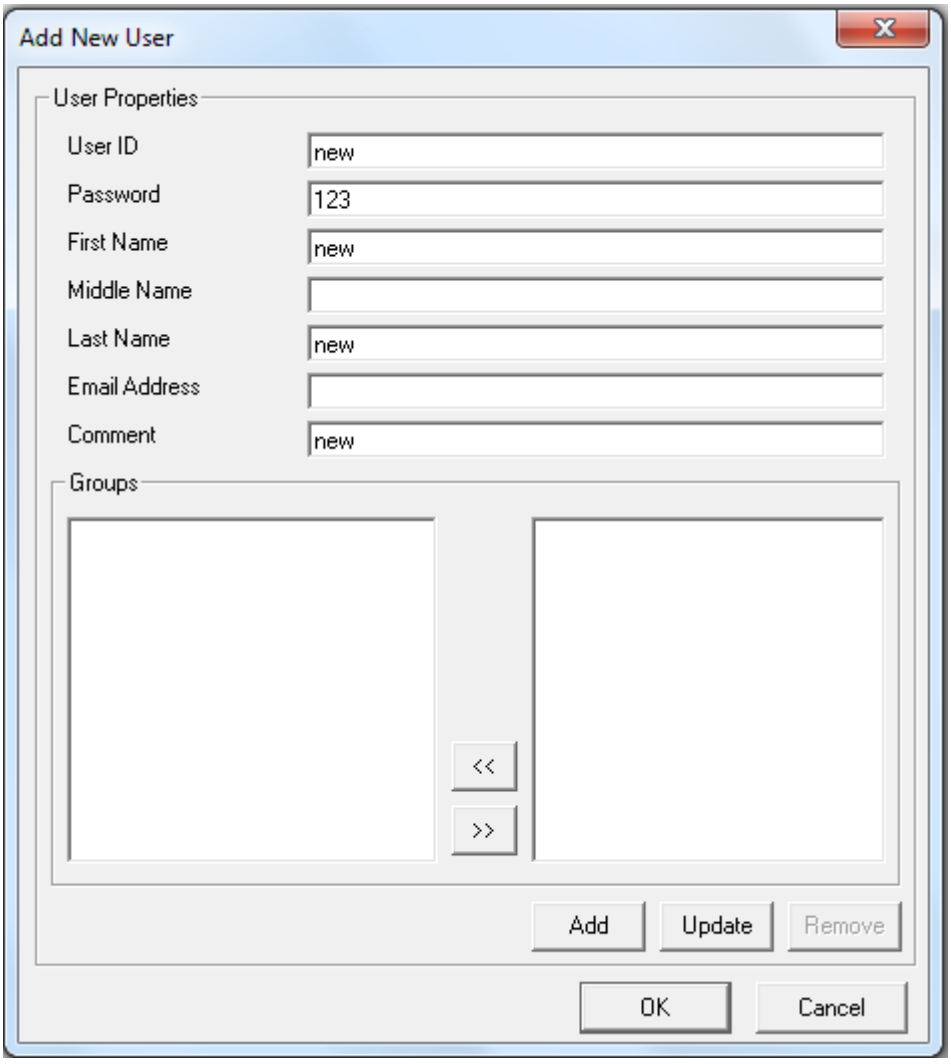
Users

These users are selected in the group. You can use the select button to select users.

Users

The Users section is used to list and manage all of users. It can also be used to Add/Edit/Delete user. Users appear in the BACnet Operator Workstation on the right hand side of the window.

To Add/Edit/Delete a user, you must first navigate the Security to the Users section you wish to modify. After navigating to the Users section, select the Add/Edit or Delete option from the pulldown menu. The Add/Edit/Delete User options from the Toolbar could also be used. The Add/Edit options will display the following dialog box.



User ID

The User ID Property is a Character String that can be edited from this dialog box.

Password

The user uses the password to log in. The password Property is a Character String that can be edited from this dialog box.

Comment

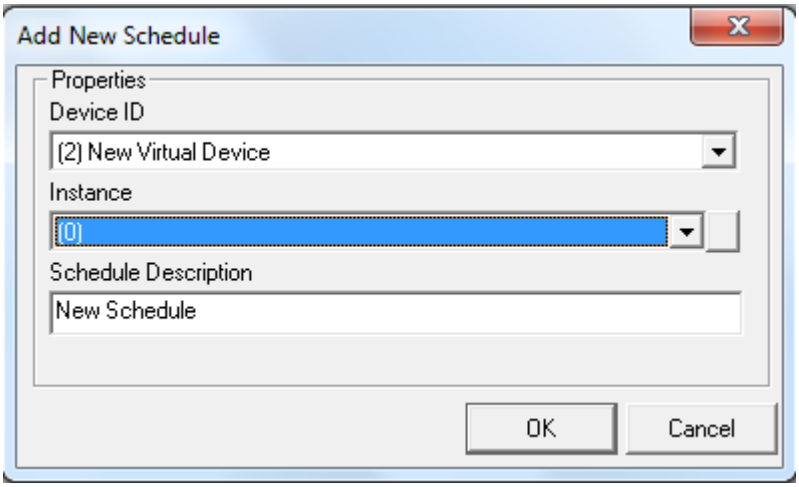
The comment Property is a Character String that can be edited from this dialog box.

Groups

The user belongs to which groups. You can use the select button to choose the groups.

Time Schedules

The Time Schedules section is used to list and manage all of time schedules. It can also be used to Add/Edit/Delete time schedules. Users appear in the BACnet Operator Workstation on the left hand side of the window. To Add/Edit/Delete Time Schedule, you must first navigate to the time schedule section you wish to modify. After navigating to the time Schedules section, select the Add/Edit or Delete option from the pulldown menu. The Add/Edit/Delete options from the Toolbar could also be used. The Add/Edit options will display the following dialog box.



Device ID

The Device ID to be referenced.

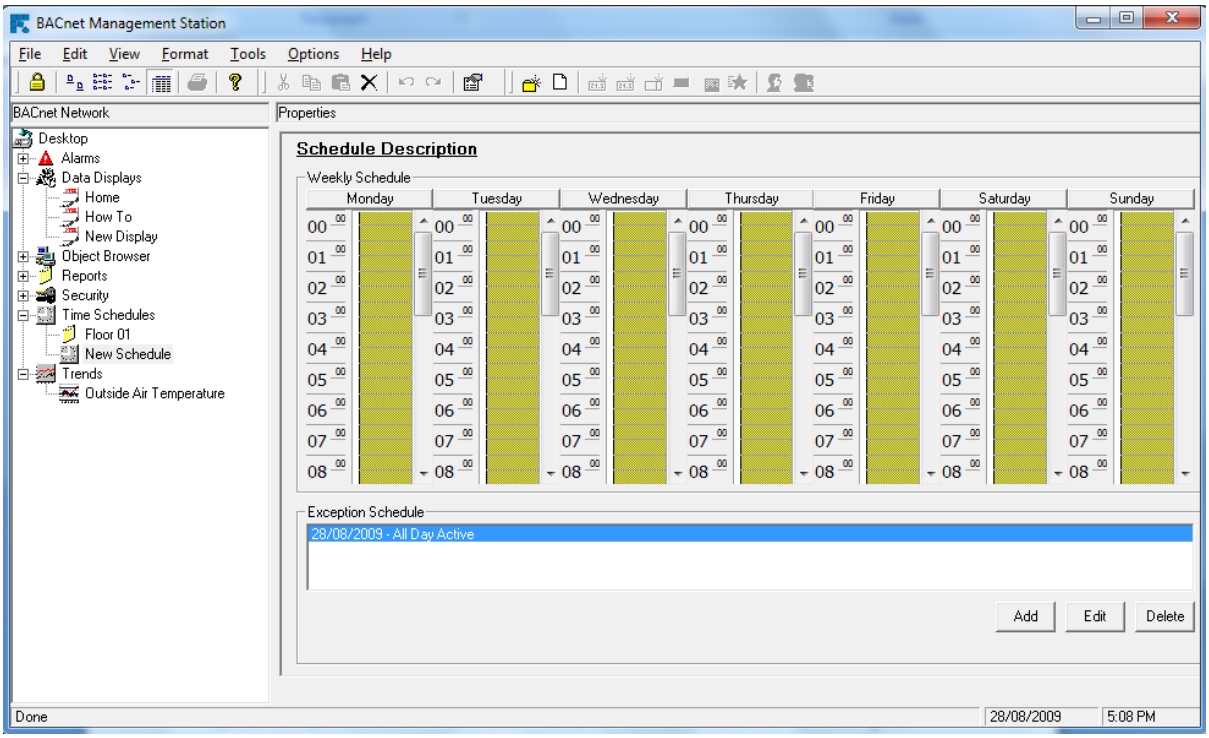
Instance

The Instance to be referenced.

Schedule Description

The Description Property is a Character String that can be edited from this dialog box.

Display Tab



Weekly Schedule

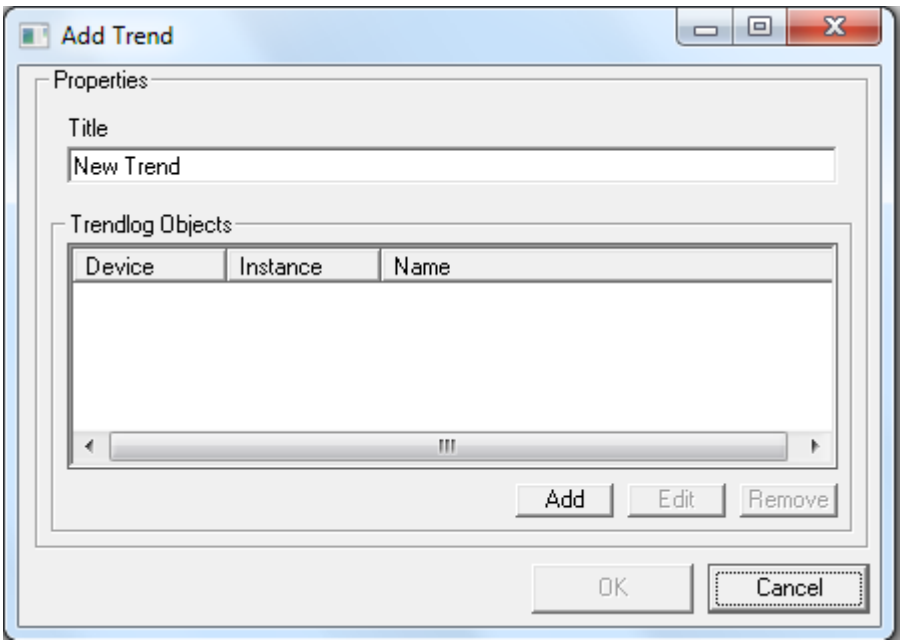
The Weekly Schedule is represented by an **Outlook** style control for each of the 7 days in the week. New Day Schedules can be added by selecting the Day Button at the top of the control for the day to be edited. Double Clicking on a Day Schedule will enable it to be edited.

Exception Schedules

The Exception Schedule is represented by the list box below the Weekly Schedule. Exception Schedules can be Added/Edited/Deleted by selecting the appropriate button. The Add/Edit options will bring up the following display for the Special Event Dialog box.

Trends

The Trends section is used to list and manage all of Trendlog objects. It can also be used to Add/Edit/Delete Trendlog objects. Trendlog objects appear in the BACnet Operator Workstation on the left hand side of the window. To Add/Edit/Delete Trendlog objects, you must first navigate to the Trend section you wish to modify. After navigating to the trends section, select the Add/Edit or Delete option from the pulldown menu. The Add/Edit/Delete options from the Toolbar could also be used. The Add option will display the following dialog box.



Title

A title name for the Trendlog Object.

Trendlog Objects

The Device, Instance and Name property of the Trendlog object can be viewed from this dialog box. These Trendlog properties can be Added/Edited/Remove by selecting the appropriate button.

Troubleshooting

BACnet Operator Workstation does not communicate to any other devices

This will happen with the evaluation version after the evaluation period has ended. The BACnet Server will stop communicating and an evaluation expired message is displayed. When this happens, the Operator station must be closed and the BACnet Server must be stopped. To stop the BACnet Server, right click on the icon in the system tray and select the exit menu item.

This may happen if the Subnet mask of the BACnet/IP device being read is not set up correctly. To check this use the ipconfig utility in Windows to check the Subnet Mask, then verify that the BACnet device is using the same Subnet mask.

This will happen if there is already a BACnet/IP device running on the same PC. For example, if a BACnet Operator station from another supplier is running on the same PC, or if another BACnet client application is already running. If this is the case, then shut down the other application.

An error message comes up each time I execute a service

The error message The **Communication** Server has not been initialized will be displayed if an the ApplicationLayer Object has unload, or it is not initialized. Be sure to Create 1 instance of this object and initialize it at startup.

BACnet Server - Logging

To assist in trouble shooting, the BACnet Server has a built in logging feature which can be easily enabled. All packets sent and received by the data link layer are stored in a file in the following location.

c:\program files\scada engine\bacnet operator workstation\common\baclog.txt

In addition, a Debug Window can be opened to log all packets to the screen. The debug window is opened by right clicking on the BACnet Server Icon in the bottom right of the Screen and selecting the Debug option.

Protocol Implementation Conformance Statement

Products

Product	Model Number	Protocol Revision	Software Version	Firmware Version
SCADA Engine BACnet Operator Workstation	SE-BOW	135-1995b (1)	1.0.0.1	1.0.0.1

Date Tested: Not Tested

Vendor Information

SCADA Engine

5A Hartnett Close
Mulgrave 3170,

Australia
www.scadaengine.com

Product Description

The SCADA Engine BACnet Operator Workstation is a software toolset which can be used to build a BACnet application. It has been developed for other developers in mind.

BACnet Standardized Device Profile

Product	Device Profile	Tested
All Products	BACnet Operator Workstation (SE-BOW)	

Supported BIBBs

Product	Supported BIBBs	BIBB Name	Tested
All Products	DS-RP-A	Data Sharing-ReadProperty-A	
	DS-RP-B	Data Sharing-ReadProperty-B	
	DS-RPM-A	Data Sharing-ReadPropertyMultiple-A	

	DS-RPM-B	Data Sharing-ReadPropertyMultiple-B	
	DS-WP-A	Data Sharing-WriteProperty-A	
	DS-WP-B	Data Sharing-WriteProperty-B	
	DS-WPM-A	Data Sharing-WritePropertyMultiple-A	
	DS-WPM-B	Data Sharing-WritePropertyMultiple-B	
	DS-COV-A	Data Sharing-COV-A	
	DS-COV-B	Data Sharing-COV-B	
	DS-COVU-A	Data Sharing-COV-Unsolicited-A	
	DS-COVU-B	Data Sharing-COV-Unsolicited-B	
	SCHED-A	Scheduling-A	
	SCHED-I-B	Scheduling-Internal-B	
	SCHED-E-B	Scheduling-External-A	
	T-VMT-A	Trending-Viewing and Modifying Trends-A	
	T-VMT-I-B	Trending-Viewing and Modifying Trends-Internal-B	
	T-VMT-E-B	Trending-Viewing and Modifying Trends-External-B	
	T-ATR-B	Trending-Automated Trend Retrieval-B	
	NM-CE-A	Network Management-Connection Establishment-A	
	NM-CE-B	Network Management-Connection Establishment-B	
	AE-N-A	Alarm and Event-Notification-A	
	AE-N-I-B	Alarm and Event-Notification Internal-B	
	AE-N-E-B	Alarm and Event-Notification External-B	
	AE-ACK-A	Alarm and Event-ACK-A	
	AE-ACK-B	Alarm and Event-ACK-B	

	AE-ASUM-A	Alarm and Event-Alarm Summary-A	
	AE-ASUM-B	Alarm and Event-Alarm Summary-B	
	AE-ESUM-A	Alarm and Event-Enrollment Summary-A	
	AE-ESUM-B	Alarm and Event-Enrollment Summary-B	
	DM-DDB-A	Device Management-Dynamic Device Binding-A	
	DM-DDB-B	Device Management-Dynamic Device Binding-B	
	DM-DOB-B	Device Management-Dynamic Object Binding-B	
	DM-DCC-B	Device Management-DeviceCommunicationControl-B	
	DM-PT-A	Device Management-Private Transfer-A	
	DM-PT-B	Device Management-Private Transfer-B	
	DM-TM-B	Device Management-Text Message-B	
	DM-TS-A	Device Management-TimeSynchronization-A	
	DM-UTC-A	Device Management-UTCTimeSynchronization-A	
	DM-LM-B	Device Management-List Manipulation-B	

Standard Object Types Supported

Product	Object Type	Creatable	Deletable	Tested
All Products	Analog Input	Yes	Yes	
	Analog Output	Yes	Yes	
	Analog Value	Yes	Yes	
	Binary Input	Yes	Yes	
	Binary Output	Yes	Yes	
	Binary Value	Yes	Yes	

	Calendar	Yes	Yes	
	Device	No	No	
	Event Enrollment	Yes	Yes	
	File	Yes	Yes	
	Loop	Yes	Yes	
	Multi-state Value	Yes	Yes	
	Notification Class	Yes	Yes	
	Program	Yes	Yes	
	Schedule	Yes	Yes	
	Trend Log	Yes	Yes	

Data Link Layer Options

Product	Data Link	Options	Tested
All Products	BACnet/IP (Annex J)	Can communicate as a Direct BACnet/IP device. Can register as a Foreign BACnet/IP device.	
	Ethernet (ISO 8802-3)		
	MS/TP Master	9600, 19200, 38400, 76800	

Segmentation Capability

Product	Segmentation Type	Supported	Window Size (MS/TP product limited to 1)	Tested
All Products	Able to transmit segmented messages	Yes	Configurable	
	Able to receive segmented messages	Yes	Configurable	

Device Address Binding

Product	Static Binding Supported	Tested
All Products	Yes	

Networking Options

Product	Router Option	Options	Tested
All Products	Router	1 BACnet/IP,	

Character Sets

Product	Character Sets supported	Tested
All Products	ANSI X3.4	